DAIKIN

SiENBE28-901

Service Manual

Air Cooled Refrigeration Condensing Unit

LRLEQ5AY1(E)
LRLEQ6AY1(E)
LRLEQ8AY1(E)
LRLEQ10AY1(E)
LRLEQ12AY1(E)
LRLEQ15AY1(E)
LRLEQ20AY1(E)

LRMEQ5AY1(E)
LRMEQ6AY1(E)
LRMEQ8AY1(E)
LRMEQ10AY1(E)
LRMEQ12AY1(E)
LRMEQ15AY1(E)
LRMEQ20AY1(E)

Air Cooled Refrigeration Condensing Unit

LRMEQ5AY1, 6AY1, 8AY1, 10AY1, 12AY1, 15AY1, 20AY1
LRLEQ5AY1, 6AY1, 8AY1, 10AY1, 12AY1, 15AY1, 20AY1

1. Introduction

Safety Precautions

☆ **Before performing design, construction, or maintenance, thoroughly read the "Safety Precautions" and also the "Installation Manual" and "Operation Manual" that come with this product.**

☆ **Precautions are classified as "⚠WARNING" or "⚠CAUTION" for the purpose of this Section. Items that mishandling highly potentially induces serious consequences such as death or serious injury are specially described under "⚠WARNING". Furthermore, even items described under "⚠CAUTION" potentially induce serious consequences depending on circumstances. All are important items for safety and must be followed without fail.**

☆ **Pictograms**

△ **This symbol alerts you to precautions to be taken.**
Sections under this symbol provide the specific descriptions of precautions.

○ **This symbol alerts you to prohibited acts.**
Sections under or in the vicinity of this symbol provide the specific descriptions of prohibited acts.

● **This symbol alerts you to mandatory acts or instructions.**
Sections under or in the vicinity of this symbol provide the specific descriptions of instructions.

☆ **After the completion of construction or repair work, conduct test run on the equipment to check it for any abnormalities, and also explain precautions for use of the equipment to customer.**

<I. Precautions for Construction and Repair>

⚠ WARNING

(1) To overhaul the equipment, be sure to turn OFF all power supplies.
Not doing so will result in an electric shock.
To repair the equipment or check for circuits with power applied, pay utmost attention not to touch any live part.

(2) If a refrigerant gas belches during work, do not touch the refrigerant gas.
Doing so will result in frostbite.

(3) To remove a welded part from the suction or discharge pipe of compressor, remove it in a well-ventilated area after thoroughly discharging a refrigerant gas.
Not doing so will cause the refrigerant gas or refrigerant oil to belch, thus resulting in injury.

(4) If a refrigerant gas leaks during work, ventilate the working area.
If the refrigerant gas comes into contact with a flame, toxic gas will be generated.

(5) The electrical parts of outdoor unit carry a high voltage. To repair these parts, thoroughly discharge electricity from the capacitor.
Not doing so will result in an electric shock.

⚠ CAUTION

(6) **Do not start or stop the air conditioner using the POWER SUPPLY switch.**
Doing so may result in a failure or water leakage.

(7) **Do not repair electrical parts with wet hand.**
Doing so may result in an electric shock.

(8) **Do not wash the air conditioner in water.**
Doing so may result in an electric shock or a fire.

(9) **Be sure to establish a ground for the equipment.**
Not doing so may result in an electric shock.

(10) **To clean the equipment, be sure to set the POWER SUPPLY switch to "OFF" to turn OFF all power supplies.**
Not doing so may result in injury because the internal fan rotates at high speeds.

(11) **To dismount the equipment, pay careful attention not to tilt it.**
Tilting the equipment may cause water remaining in the equipment to fall in drops, thus wetting goods kept in storage.

(12) **Check whether or not the refrigerating cycle part gets hot, and then repair the equipment.**
Not doing so may result in a burn.

(13) **Use a welder in well-ventilated areas.**
Using the welder in an enclosed room may result in lack of oxygen.

<II. Precautions for Equipment after Construction and Repair>

⚠ WARNING

(14) **To repair the equipment, be sure to use parts listed in the List of Service Parts for the applicable model and proper tools. Furthermore, NEVER make any modification to the equipment.**
Not observing this warning will result in an electric shock, heat generation, or a fire.

(15) **To install or relocate an air conditioner, select a location capable of supporting the weight of the air conditioner.**
The insufficient strength of the location or improper installation of the air conditioner will cause the unit to drop, thus resulting in injury.

⚠ WARNING

(16) **Conduct electrical works according to information in the "Electrical Equipment Technical Standards", "Internal Wiring Regulations", and Installation Manual, and further be sure to use dedicated circuits. Insufficient capacity of the power supply circuit and faulty electrical works will result in an electric shock or a fire.**

(17) **To make wirings between indoor and outdoor units, use specified wires to securely connect them, and fix them so that the external force of cables will not be transmitted to terminal connections.**
Imperfect connections or fixing will result in heat generation or a fire.

(18) **To make wirings between indoor and outdoor units or for power supply, form wires so that structures such as the service lid will not be lifted, and properly mount the lid.**
Improperly mounting the lid will result in heat generation of the terminal part, an electric shock, or a fire.

(19) **Do not cause damage to or process the power supply cord.**
Doing so will result in an electric shock or a fire.
Putting heavy things on, heating, or pulling the power supply cord will result in damage to it.

(20) **Do not cause anything other than the specified refrigerant (e.g. air) to get mixed in the refrigerant system.**
Doing so will cause the refrigerant system to have abnormally high internal pressure, thus resulting in damage to the equipment or bodily injury.

(21) **Should the equipment have leakage of refrigerant gas, locate leaking points, and then repair them without fail. Subsequently, refill the equipment with a specified quantity of refrigerant.**
If no leaking points are located and thereby repair work is to be discontinued, perform pump-down operation, and then close the service valve. Not doing so will result in refrigerant gas leakage.
The refrigerant gas itself is harmless, but if it comes into contact with a flame from a fan heater, stove, or stove burner, toxic gas will be generated.

⚠ CAUTION

(22) **A ground leakage circuit breaker needs to be mounted.**

Mounting no ground leakage circuit breaker may result in an electric shock or a fire.

(23) **Do not install the equipment in places with the potential for leakage of flammable gas.**
Should a flammable gas leak to accumulate around the equipment, the gas may catch fire.

<III. Precautions after Construction and Repair>

⚠ WARNING

(24) Check power supply terminals for deposition of dust or for any loose terminals.

Deposition of dust on or imperfect connections of the terminals will result in an electric shock or a fire.

(25) Be sure to replace flawed or deteriorated power supply cord or lead wires.

Not doing so will result in an electric shock, heat generation, or a fire.

(26) Do not connect the power supply cord halfway or with many loads of other electrical fittings on one electric outlet.

Doing so will result in an electric shock, heat generation, or a fire.

⚠ CAUTION

(27) Check to be sure that the mounting positions and wiring conditions of parts as well as the connections of soldered parts and crimpstyle terminals are all normal.

If any of these items is abnormal, an electric shock, heat generation, or a fire may result.

(28) If the installation base or mounting frames are reduced in strength due to corrosion, replace them.

Not doing so may cause the equipment to drop, thus resulting in injury.

(29) Check for the grounding state. If the ground is in an imperfect state, rectify it.

Imperfect ground may result in an electric shock.

(30) After the completion of repair, be sure to make measurement of insulation resistance to prove that it is not less than 1MΩ.

Insulation failures may result in an electric shock.

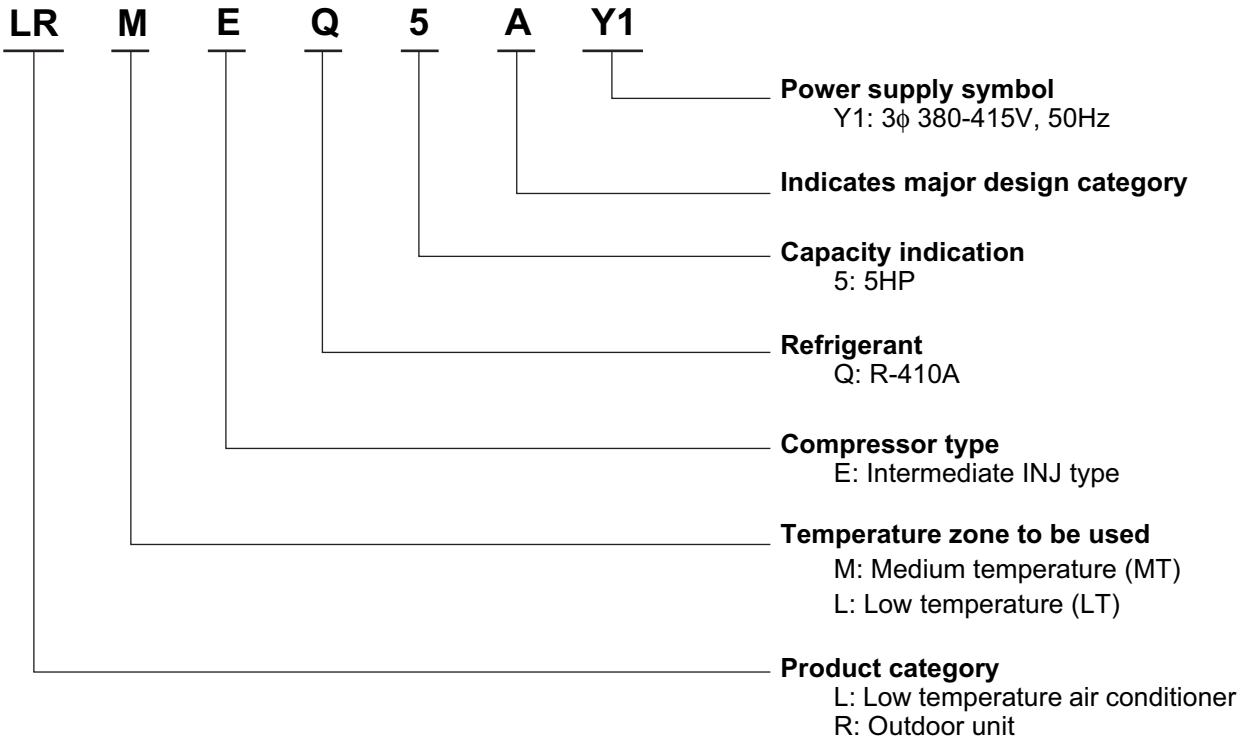
(31) After the completion of repair, be sure to check the indoor unit for drainage.

Insufficient draining from the indoor unit may result in the entry of water into a room, thus wetting furniture and household goods.

Air Cooled Refrigeration Condensing Unit

Nomenclature

■ Outdoor unit



2. Standard Specification

2.1 Standard Specification

Model ★1			LRMEQ5AY1 [LRMEQ5AY1E]	LRMEQ6AY1 [LRMEQ6AY1E]
Power Supply			3 phase 50Hz 380-415V	
Capacity ★2		kW	12.2	14.4
Range of Suction Pressure Equivalent Saturation Temperature		°C	-20~+10	
Range of Outdoor Temperature		°C	-15~+43	
Casing Color			Ivory white (5Y7.5/1) [Light camel (2.5Y6.5/1.5)]	
Dimensions: (H×W×D)		mm	1680×635×765	
Heat Exchanger			Cross fin coil	
Compressor	Type		Hermetically sealed scroll type	
	Piston Displacement	m^3/h	10.04	13.85
	Number of Revolutions	r.p.m	4740	6540
	Motor Output × Number of Units	kW	2.3	3.2
	Starting Method		Direct-on-line (Inverter system)	
Fan	Type		Propeller fan	
	Motor Output	kW	0.35×1	
	Air Flow Rate	m^3/min	95	102
	Drive		Direct drive	
Connecting Pipes	Liquid Pipe		ϕ9.5 C1220T (Brazing connection)	
	Gas Pipe		ϕ19.1 C1220T (Brazing connection)	
Receiver Volume			5.4	
Mass		kg	175	
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector, Fusible Plug	
Capacity Control		%	33~100	24~100
Refrigerant	Refrigerant Name		R410A	
	Charge Volume	kg	5.2	
Refrigerant Oil	Refrigerant Oil Name		DAPHNE FVC68D	
	Charge Volume	L	1.7+2.5	
Operating Sound ★3		dBA	54	56
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	

Notes:

★1 [ ] shows the anti-corrosion treatment type.
★2 Rated conditions of the refrigeration equipment :
Saturated temperature equivalent to suction pressure: -10°C
Outdoor air: 32°C, Suction SH: 10°C
★3 Measurement place: Front: 1m, Height: 1.5m
4 The minimum connection load with inside unit: 2.0kW

Model ★1			**LRMEQ8AY1 [LRMEQ8AY1E]**	**LRMEQ10AY1 [LRMEQ10AY1E]**	**LRMEQ12AY1 [LRMEQ12AY1E]**
Power Supply			3 phase 50Hz 380-415V		
Capacity ★2		kW	18.6	21.8	24.4
Range of Suction Pressure Equivalent Saturation Temperature		°C	-20~+10		
Range of Outdoor Temperature		°C	-15~+43		
Casing Color			Ivory white (5Y7.5/1) [Light camel (2.5Y6.5/1.5)]		
Dimensions: (H×W×D)		mm	1680×930×765		
Heat Exchanger			Cross fin coil		
Compressor	Type		Hermetically sealed scroll type		
	Piston Displacement	m^3/h	19.68	23.36	25.27
	Number of Revolutions	r.p.m	4320, 2900	6060, 2900	6960, 2900
	Motor Output × Number of Units	kW	2.1+3.6	3.0+3.6	3.4+3.6
	Starting Method		Direct-on-line (Inverter system)		
Fan	Type		Propeller fan		
	Motor Output	kW	0.75×1		
	Air Flow Rate	m^3/min	171	179	191
	Drive		Direct drive		
Connecting Pipes	Liquid Pipe		ϕ9.5 C1220T (Brazing connection)		
	Gas Pipe		ϕ25.4 C1220T (Brazing connection)		
Receiver Volume			8.1		
Mass		kg	255		
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector, Fusible Plug		
Capacity Control		%	17~100	14~100	13~100
Refrigerant	Refrigerant Name		R410A		
	Charge Volume	kg	7.9		
Refrigerant Oil	Refrigerant Oil Name		DAPHNE FVC68D		
	Charge Volume	L	1.7+2.1+3.0		
Operating Sound ★3		dBA	57	59	61
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps		

Notes:

★1 [ ] shows the anti-corrosion treatment type.
★2 Rated conditions of the refrigeration equipment :
Saturated temperature equivalent to suction pressure: -10°C
Outdoor air: 32°C, Suction SH: 10°C
★3 Measurement place: Front: 1m, Height: 1.5m
4 The minimum connection load with inside unit: 2.0kW

Model ★1			LRMEQ15AY1 [LRMEQ15AY1E]	LRMEQ20AY1 [LRMEQ20AY1E]
Power Supply			3 phase 50Hz 380-415V	
Capacity ★2		kW	32.2	37.0
Range of Suction Pressure Equivalent Saturation Temperature		°C	-20~+10	
Range of Outdoor Temperature		°C	-15~+43	
Casing Color			Ivory white (5Y7.5/1) [Light camel (2.5Y6.5/1.5)]	
Dimensions: (H×W×D)		mm	1680×1240×765	
Heat Exchanger			Cross fin coil	
Compressor	Type		Hermetically sealed scroll type	
	Piston Displacement	m^3/h	30.00	35.80
	Number of Revolutions	r.p.m	5640, 2900	6960, 2900
	Motor Output × Number of Units	kW	2.8+3.6+3.6	3.4+3.6+3.6
	Starting Method		Direct-on-line (Inverter system)	
Fan	Type		Propeller fan	
	Motor Output	kW	0.75×2	
	Air Flow Rate	m^3/min	230	240
	Drive		Direct drive	
Connecting Pipes	Liquid Pipe		ϕ12.7 C1220T (Brazing connection)	
	Gas Pipe		ϕ31.8 C1220T (Brazing connection)	
Receiver Volume			12.1	
Mass		kg	355	
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector, Fusible Plug	
Capacity Control		%	10~100	9~100
Refrigerant	Refrigerant Name		R410A	
	Charge Volume	kg	11.5	
Refrigerant Oil	Refrigerant Oil Name		DAPHNE FVC68D	
	Charge Volume	L	1.7+2.1+2.1+4.0	
Operating Sound ★3		dBA	62	63
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	

Notes:

★1 [ ] shows the anti-corrosion treatment type.
★2 Rated conditions of the refrigeration equipment :
Saturated temperature equivalent to suction pressure: -10°C
Outdoor air: 32°C, Suction SH: 10°C
★3 Measurement place: Front: 1m, Height: 1.5m
4 The minimum connection load with inside unit: 2.0kW

Model ★1			**LRLEQ5AY1 [LRLEQ5AY1E]**	**LRLEQ6AY1 [LRLEQ6AY1E]**
Power Supply			3 phase 50Hz 380-415V	
Capacity ★2		kW	5.4	6.3
Range of Suction Pressure Equivalent Saturation Temperature		°C	-45~-20	
Range of Outdoor Temperature		°C	-15~+43	
Casing Color			Ivory white (5Y7.5/1) [Light camel (2.5Y6.5/1.5)]	
Dimensions: (H×W×D)		mm	1680×635×765	
Heat Exchanger			Cross fin coil	
Compressor	Type		Hermetically sealed scroll type	
	Piston Displacement	m^3/h	10.04	13.85
	Number of Revolutions	r.p.m	4740	6540
	Motor Output × Number of Units	kW	2.3	3.2
	Starting Method		Direct-on-line (Inverter system)	
Fan	Type		Propeller fan	
	Motor Output	kW	0.35×1	
	Air Flow Rate	m^3/min	95	102
	Drive		Direct drive	
Connecting Pipes	Liquid Pipe		ϕ9.5 C1220T (Brazing connection)	
	Gas Pipe		ϕ19.1 C1220T (Brazing connection)	
Receiver Volume			5.4	
Mass		kg	175	
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector, Fusible Plug	
Capacity Control		%	33~100	24~100
Refrigerant	Refrigerant Name		R410A	
	Charge Volume	kg	5.2	
Refrigerant Oil	Refrigerant Oil Name		DAPHNE FVC68D	
	Charge Volume	L	1.7+2.5	
Operating Sound ★3		dBA	54	56
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	

Notes:

★1 [ ] shows the anti-corrosion treatment type.

★2 Rated conditions of the refrigeration equipment :
Saturated temperature equivalent to suction pressure: -35°C
Outdoor air: 32°C, Suction SH: 10°C

★3 Measurement place: Front: 1m, Height: 1.5m

4 The minimum connection load with inside unit: 1.6kW

Model ★1			LRLEQ8AY1 [LRLEQ8AY1E]	LRLEQ10AY1 [LRLEQ10AY1E]	LRLEQ12AY1 [LRLEQ12AY1E]
Power Supply			3 phase 50Hz 380-415V		
Capacity ★2		kW	8.0	9.4	10.3
Range of Suction Pressure Equivalent Saturation Temperature		°C	-45~-20		
Range of Outdoor Temperature		°C	-15~+43		
Casing Color			Ivory white (5Y7.5/1) [Light camel (2.5Y6.5/1.5)]		
Dimensions: (H×W×D)		mm	1680×930×765		
Heat Exchanger			Cross fin coil		
Compressor	Type		Hermetically sealed scroll type		
	Piston Displacement	m^3/h	19.68	23.36	25.27
	Number of Revolutions	r.p.m	4320, 2900	6060, 2900	6960, 2900
	Motor Output × Number of Units	kW	2.1+3.6	3.0+3.6	3.4+3.6
	Starting Method		Direct-on-line (Inverter system)		
Fan	Type		Propeller fan		
	Motor Output	kW	0.75×1		
	Air Flow Rate	m^3/min	171	179	191
	Drive		Direct drive		
Connecting Pipes	Liquid Pipe		ϕ9.5 C1220T (Brazing connection)		
	Gas Pipe		ϕ25.4 C1220T (Brazing connection)		
Receiver Volume			8.1		
Mass		kg	255		
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector, Fusible Plug		
Capacity Control		%	17~100	14~100	13~100
Refrigerant	Refrigerant Name		R410A		
	Charge Volume	kg	7.9		
Refrigerant Oil	Refrigerant Oil Name		DAPHNE FVC68D		
	Charge Volume	L	1.7+2.1+3.0		
Operating Sound ★3		dBA	57	59	61
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps		

Notes:

★1 [ ] shows the anti-corrosion treatment type.
★2 Rated conditions of the refrigeration equipment :
Saturated temperature equivalent to suction pressure: -35°C
Outdoor air: 32°C, Suction SH: 10°C
★3 Measurement place: Front: 1m, Height: 1.5m
4 The minimum connection load with inside unit: 1.6kW

Model ★1			LRLEQ15AY1 [LRLEQ15AY1E]	LRLEQ20AY1 [LRLEQ20AY1E]
Power Supply			3 phase 50Hz 380-415V	
Capacity ★2		kW	13.6	15.1
Range of Suction Pressure Equivalent Saturation Temperature		°C	-45~-20	
Range of Outdoor Temperature		°C	-15~+43	
Casing Color			Ivory white (5Y7.5/1) [Light camel (2.5Y6.5/1.5)]	
Dimensions: (H×W×D)		mm	1680×1240×765	
Heat Exchanger			Cross fin coil	
Compressor	Type		Hermetically sealed scroll type	
	Piston Displacement	m^3/h	30.00	35.80
	Number of Revolutions	r.p.m	5640, 2900	6960, 2900
	Motor Output × Number of Units	kW	2.8+3.6+3.6	3.4+3.6+3.6
	Starting Method		Direct-on-line (Inverter system)	
Fan	Type		Propeller fan	
	Motor Output	kW	0.75×2	
	Air Flow Rate	m^3/min	230	240
	Drive		Direct drive	
Connecting Pipes	Liquid Pipe		ϕ12.7 C1220T (Brazing connection)	
	Gas Pipe		ϕ31.8 C1220T (Brazing connection)	
Receiver Volume			12.1	
Mass		kg	355	
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector, Fusible Plug	
Capacity Control		%	10~100	9~100
Refrigerant	Refrigerant Name		R410A	
	Charge Volume	kg	11.5	
Refrigerant Oil	Refrigerant Oil Name		DAPHNE FVC68D	
	Charge Volume	L	1.7+2.1+2.1+4.0	
Operating Sound ★3		dBA	62	63
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	

Notes:

★1 [ ] shows the anti-corrosion treatment type.

★2 Rated conditions of the refrigeration equipment :
Saturated temperature equivalent to suction pressure: -35°C
Outdoor air: 32°C, Suction SH: 10°C

★3 Measurement place: Front: 1m, Height: 1.5m

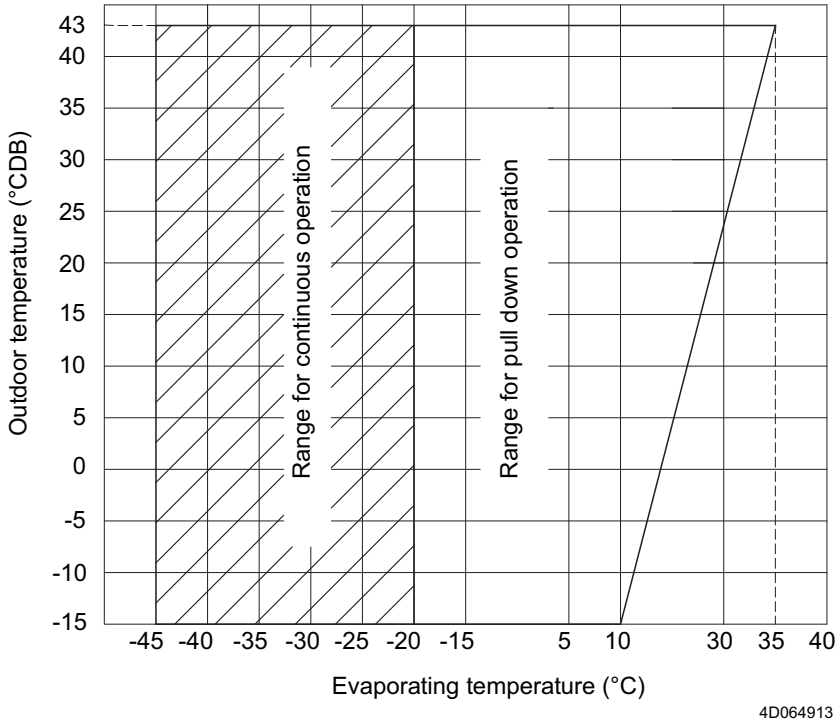
4 The minimum connection load with inside unit: 1.6kW

2.2 Set Values for Functional Components and Protection Devices

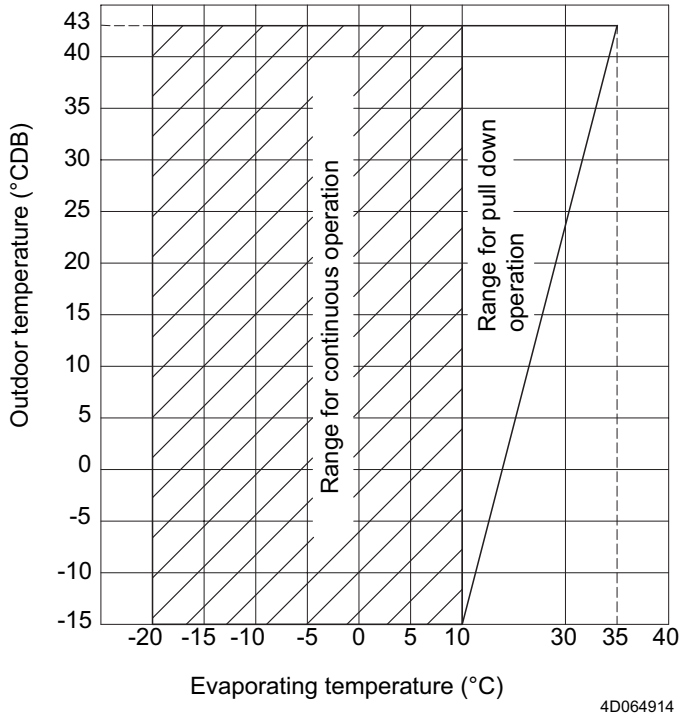
Component				Electric symbol	LRMEQ5AY1,6AY1 LRLEQ5AY1,6AY1	LRMEQ8AY1,10AY1,12AY1 LRLEQ8AY1,10AY1,12AY1	LRMEQ15AY1,20AY1 LRLEQ15AY1,20AY1
Compressor	Inverter	Type		M1C	JT1GFDKTNYR@SB		
		Overcurrent protection device			14.7A		
	STD1	Type		M2C	—	JT17GFKTNYE@SB	
		Overcurrent protection device			—	13A	
	STD2	Type		M3C	—	—	JT17GFKTNYE@SB
		Overcurrent protection device			—	—	13A
Fan motor		Output		M1F	350W	750W	
		Overcurrent protection device			1.5A	3.0A	
		Output		M2F	—	—	750W
		Overcurrent protection device			—	—	3.0A
PCB		Main PCB		A1P	Standard:EB09058		
		PCB for compressor INV		A3P	Standard:PC0509-2		
		PCB for fan INV		A4P	PC0511-3(A)	PC0511-1(A)	
				A8P	—	—	PC0511-2(A)
		PCB for operation input		A5P	EB0568(A)		
		PCB for noise filter		A2P	FN354-H-1(A)		
		PCB for current sensor		A6P	—	EB0292(C)	
				A7P	—	—	EB0292(C)
		PCB for earth leakage detection		A9P	EC0726(A)-9		EC0729(A)-29
Electronic expansion valve			Coil	Y1E (Main)	UKV-A023	UKV-A023	UKV-A024
					DC12V, 0.26A	DC12V, 0.26A	DC12V, 0.26A
			Body		UKV-32D49		
					0~480pls		
			Coil	Y2E (Gas)	UKV-A023	UKV-A023	UKV-A024
					DC12V, 0.26A	DC12V, 0.26A	DC12V, 0.26A
			Body		UKV-18D20		
					0~480pls		
			Coil	Y3E (M1C)	—	UKV-A023	UKV-A024
					—	DC12V, 0.26A	DC12V, 0.26A
			Body		—	UKV-32D49	
					—	0~480pls	
Four way valve			Coil	Y3S	STF-G01AQ531A1	STF-G01AQ532A1	STF-G01AQ537A1
			Body		STF-0404G	STF-0713G	STF2011G
Solenoid valve			Coil	Y2S (M2C)	—	NEV-MOAJ562D1	NEV-MOAJ562D1
			Body		—	VPV-603D	VPV-603D
			Coil	Y5S (M3C)	—	—	NEV-MOAJ562C1
			Body		—	—	VPV-603D
Pressure protection device		High pressure switch	Type	S1PH	ACB-1TB29W	ACB-1TB28W	ACB-1TB27W
			Set value		OFF 3.8 $^{+0}_{-0.1}$ MPa ON 2.85±0.15MPa		
			Type	S2PH	—	ACB-1TB27W	ACB-1TB27W
			Set value		—	OFF 3.8 $^{+0}_{-0.1}$ MPa	ON 2.85±0.15MPa
			Type	S3PH	—	—	ACB-1TB27W
			Set value		—	—	OFF 3.8 $^{+0}_{-0.1}$ MPa ON 2.85±0.15MPa
			Type	S4PH	ACB-JB285		
			Set value		DC5V ON: 2.96 $^{+0}_{-0.1}$ MPa OFF: 2.16±0.15MPa		
		Low pressure sensor		S1NPL	150NH4-L2	200NH4-L2	200NH4-L2
		High pressure sensor		S1NPH	150NH4-H4	150NH4-H4	200NH4-H4
		Fusible plug		—	Open: 70~75°C		
Thermistor		Outdoor air thermistor		R1T	ST8603		
		Suction pipe thermistor		R2T	ST0602		
		Outdoor heat exchanger outlet thermistor		R3T	ST8602A		
		Subcooling heat exchanger outlet thermistor		R5T	ST0601		
		Subcooling heat exchanger inlet thermistor		R6T	ST0601		
		Discharge pipe thermistor		R31T	ST0901		
				R32T	—	ST0901	
				R33T	—	—	ST0901
Fuse (A1P)				F1U, F2U	250VAC 3.15A, Class T		
Fuse				F3U, F4U	250VAC 1.0A, Class T		
Operation switch				S1S	AR22PR-311B Z9		

2.3 Operation Limits

LRLEQ5, 6, 8, 10, 12, 15, 20AY1(E)



LRMEQ5, 6, 8, 10, 12, 15, 20AY1(E)



NOTES

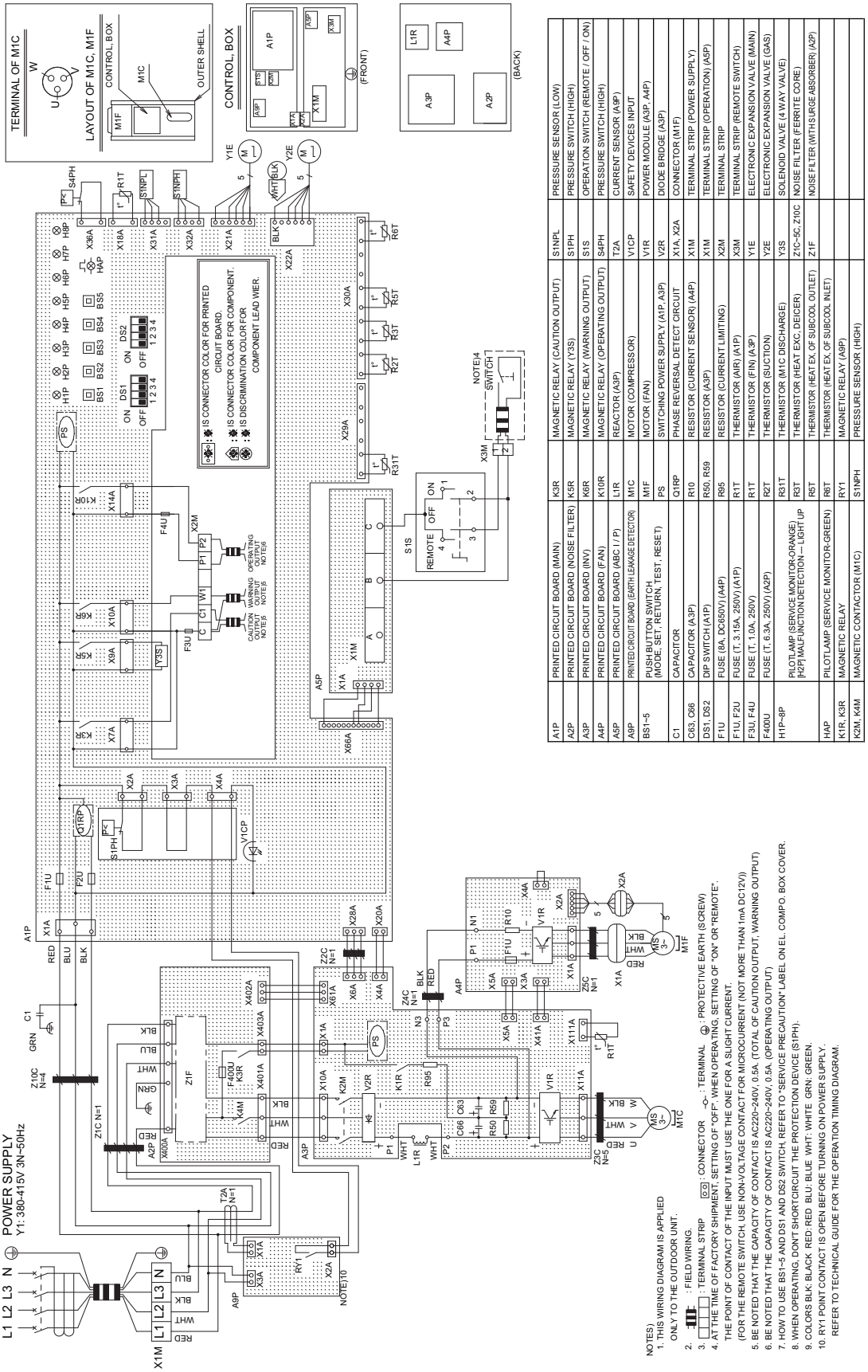
∗1. “Range for continuous operation” SHOWS POSSIBLE RANGE OF CONTINUOUS OPERATION.

∗2. “Range for pull down operation” SHOWS POSSIBLE RANGE OF SHORT-TIME OPERATION.

- DO NOT SELECT THE MODEL IN THE RANGE FOR PULL DOWN OPERATION.
- TO BE MORE THAN 3°C/HOUR THAT THE TEMPERATURE OF INDOOR UNIT DROPS. DO NOT OPEN THE DOOR AND DO NOT ENTER THE GOODS IN PULL DOWN OPERATION AS MUCH AS.

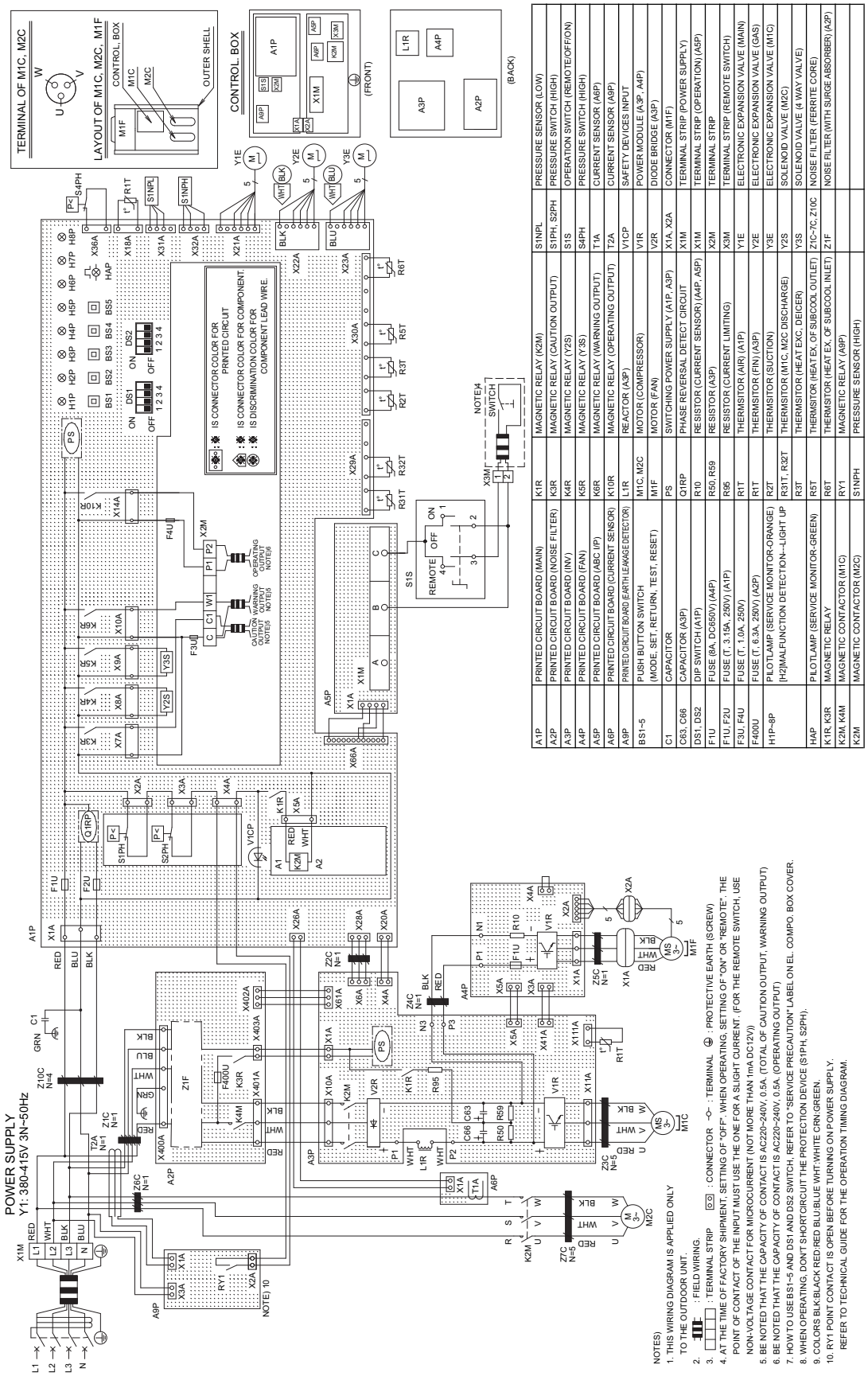
2.4 Wiring Diagram

LRLEQ5A, 6AY1(E)
LRMEQ5A, 6AY1(E)

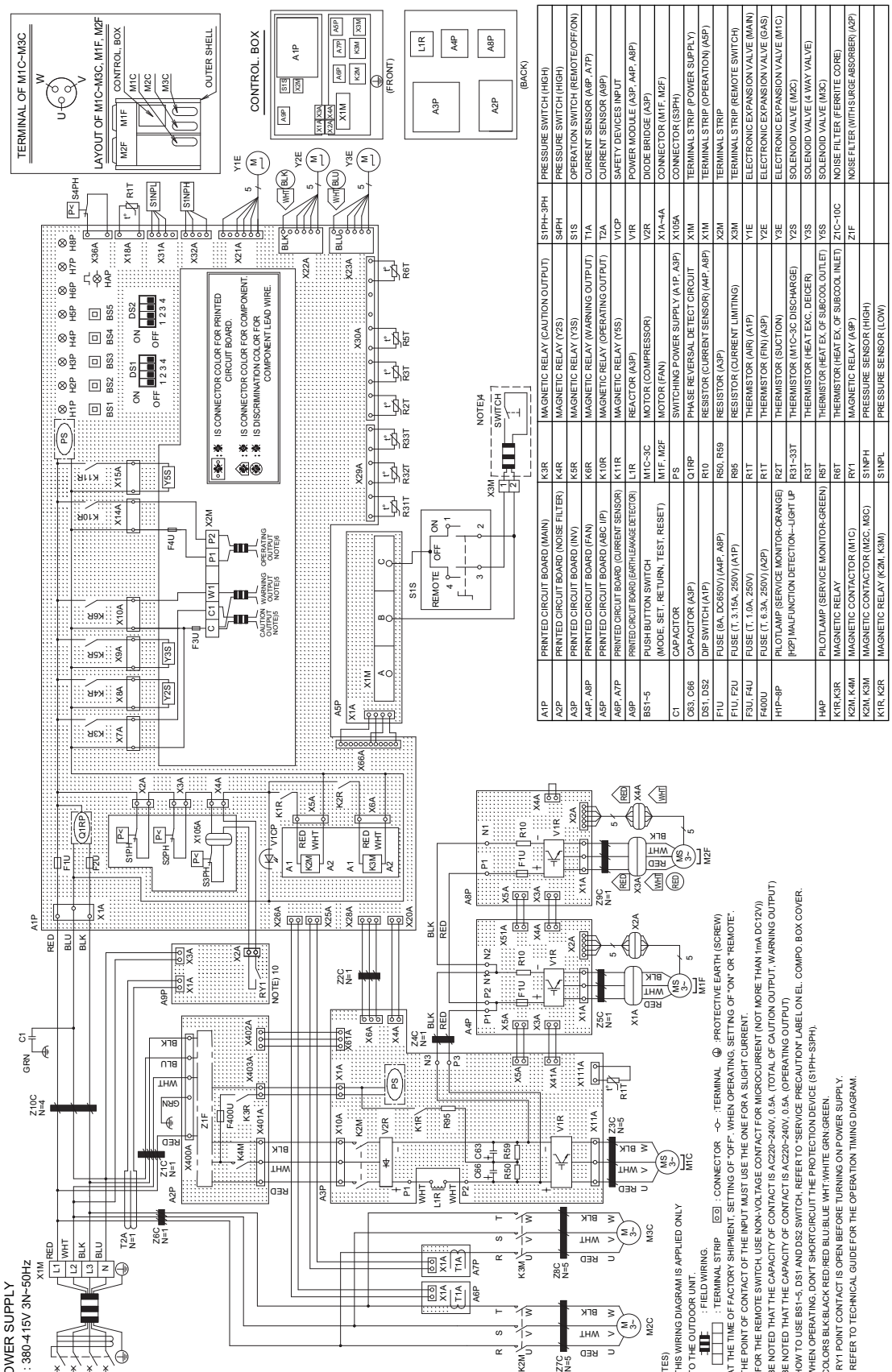


A1P	PRINTED CIRCUIT BOARD (MAIN)	K3R	MAGNETIC RELAY (CAUTION OUTPUT)	S1NPL	PRESSURE SENSOR (LOW)
A2P	PRINTED CIRCUIT BOARD (NOISE FILTER)	K5R	MAGNETIC RELAY (Y3S)	S1PH	PRESSURE SWITCH (HIGH)
A3P	PRINTED CIRCUIT BOARD (INV)	K6R	MAGNETIC RELAY (WARNING OUTPUT)	S1S	OPERATION SWITCH (REMOTE / OFF / ON)
A4P	PRINTED CIRCUIT BOARD (FAN)	K10R	MAGNETIC RELAY (OPERATING OUTPUT)	S4PH	PRESSURE SWITCH (HIGH)
A5P	PRINTED CIRCUIT BOARD (ABC I / P)	L1R	REACTOR (A3P)	T2A	CURRENT SENSOR (A9P)
A9P	PRINTED CIRCUIT BOARD (EARTH LEAKAGE DETECTOR)	M1C	MOTOR (COMPRESSOR)	V1CP	SAFETY DEVICES INPUT
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)	M1F	MOTOR (FAN)	V1R	POWER MODULE (A3P, A4P)
		PS	SWITCHING POWER SUPPLY (A1P, A3P)	V2R	DIODE BRIDGE (A3P)
C1	CAPACITOR	Q1RP	PHASE REVERSAL DETECT CIRCUIT	X1A, X2A	CONNECTOR (M1F)
C63, C66	CAPACITOR (A3P)	R10	RESISTOR (CURRENT SENSOR) (A4P)	X1M	TERMINAL STRIP (POWER SUPPLY)
DS1, DS2	DIP SWITCH (A1P)	R50, R59	RESISTOR (A3P)	X1M	TERMINAL STRIP (OPERATION) (A5P)
F1U	FUSE (8A, DC650V) (A4P)	R95	RESISTOR (CURRENT LIMITING)	X2M	TERMINAL STRIP
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)	R1T	THERMISTOR (AIR) (A1P)	X2M	TERMINAL STRIP (REMOTE SWITCH)
F3U, F4U	FUSE (T, 1.0A, 250V)	R1T	THERMISTOR (FIN) (A3P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN)
F400U	FUSE (T, 6.3A, 250V) (A2P)	R2T	THERMISTOR (SUCTION)	Y2E	ELECTRONIC EXPANSION VALVE (SAS)
H1P~8P	PILOTLAMP (SERVICE MONITOR-ORANGE) [H2P] MALFUNCTION DETECTION – LIGHT UP	R31T	THERMISTOR (M1C DISCHARGE)	Y3S	SOLENOID VALVE (4 WAY VALVE)
		R3T	THERMISTOR (HEAT EXC. DEICER)	Z1C~5C, Z10C	NOISE FILTER (FERRITE CORE)
		R5T	THERMISTOR (HEAT EX. OF SUBCOOL OUTLET)	Z1F	NOISE FILTER (WITH SURGE ABSORBER) (A2P)
HAP	PILOTLAMP (SERVICE MONITOR-GREEN)	R6T	THERMISTOR (HEAT EX. OF SUBCOOL INLET)		
K1R, K3R	MAGNETIC RELAY	RY1	MAGNETIC RELAY (A9P)		
K2M, K4M	MAGNETIC CONTACTOR (M1C)	S1NPH	PRESSURE SENSOR (HIGH)		

LRLEQ8A, 10A, 12AY1(E)
LRMEQ8A, 10A, 12AY1(E)



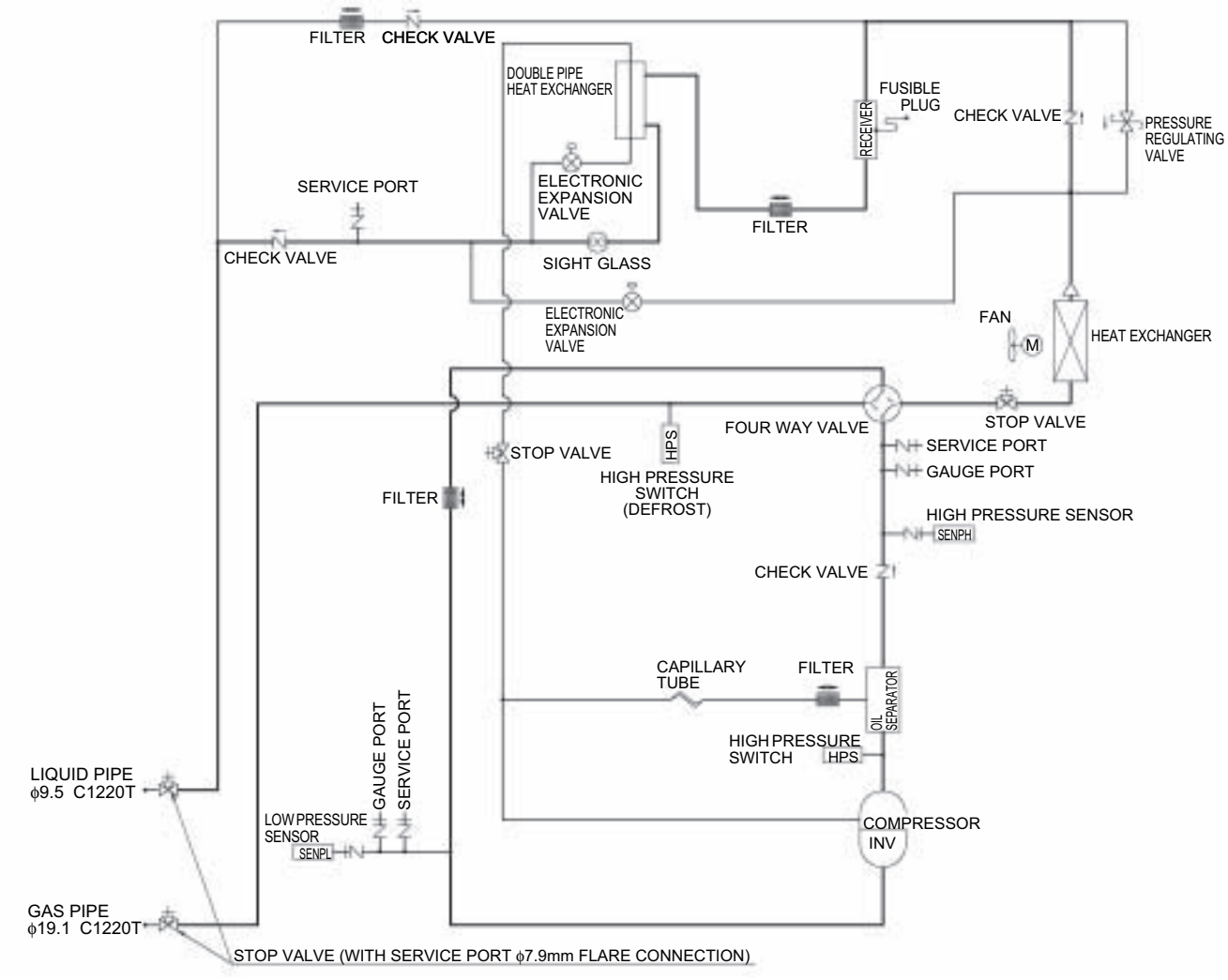
LRLEQ15A, 20AY1(E)
LRMEQ15A, 20AY1(E)



A1P	PRINTED CIRCUIT BOARD (MAIN)	K3R	MAGNETIC RELAY (CAUTION OUTPUT)	S1PH~3PH	PRESSURE SWITCH (HIGH)
A2P	PRINTED CIRCUIT BOARD (NOISE FILTER)	K4R	MAGNETIC RELAY (Y2S)	S4PH	PRESSURE SWITCH (HIGH)
A3P	PRINTED CIRCUIT BOARD (INV)	K5R	MAGNETIC RELAY (Y3S)	S1S	OPERATION SWITCH (REMOTE/OFF/ON)
A4P, A8P	PRINTED CIRCUIT BOARD (FAN)	K6R	MAGNETIC RELAY (WARNING OUTPUT)	T1A	CURRENT SENSOR (A8P, A7P)
A5P	PRINTED CIRCUIT BOARD (ABC I/P)	K10R	MAGNETIC RELAY (OPERATING OUTPUT)	T2A	CURRENT SENSOR (A9P)
A6P, A7P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K11R	MAGNETIC RELAY (Y5S)	V1CP	SAFETY DEVICES INPUT
A9P	PRINTED CIRCUIT BOARD (EARTH LEAKAGE DETECTOR)	L1R	REACTOR (A3P)	V1R	POWER MODULE (A3P, A4P, A8P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)	M1C~3C	MOTOR (COMPRESSOR)	V2R	DIODE BRIDGE (A3P)
		M1F, M2F	MOTOR (FAN)	X1A~4A	CONNECTOR (M1F, M2F)
C1	CAPACITOR	PS	SWITCHING POWER SUPPLY (A1P, A3P)	X105A	CONNECTOR (S3PH)
C63, C66	CAPACITOR (A3P)	Q1RP	PHASE REVERSAL DETECT CIRCUIT	X1M	TERMINAL STRIP (POWER SUPPLY)
DS1, DS2	DIP SWITCH (A1P)	R10	RESISTOR (CURRENT SENSOR) (A4P, A8P)	X1M	TERMINAL STRIP (OPERATION) (A3P)
F1U	FUSE (8A, DC650V) (A4P, A8P)	R50, R59	RESISTOR (A3P)	X2M	TERMINAL STRIP
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)	R95	RESISTOR (CURRENT LIMITING)	X3M	TERMINAL STRIP (REMOTE SWITCH)
F3U, F4U	FUSE (T, 1.0A, 250V)	R1T	THERMISTOR (AIR) (A1P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN)
F400U	FUSE (T, 6.3A, 250V) (A2P)	R1T	THERMISTOR (FIN) (A3P)	Y2E	ELECTRONIC EXPANSION VALVE (GAS)
H1P~8P	PILOTLAMP (SERVICE MONITOR-ORANGE) (H2P) MALFUNCTION DETECTION--LIGHT UP	R2T	THERMISTOR (SUCTION)	Y3E	ELECTRONIC EXPANSION VALVE (M1C)
		R31~33T	THERMISTOR (M1C~3C DISCHARGE)	Y2S	SOLENOID VALVE (M2C)
		R3T	THERMISTOR (HEAT EXC. DEICER)	Y3S	SOLENOID VALVE (4 WAY VALVE)
HAP	PILOTLAMP (SERVICE MONITOR-GREEN)	R5T	THERMISTOR (HEAT EX. OF SUBCOOL OUTLET)	Y5S	SOLENOID VALVE (M3C)
K1R, K3R	MAGNETIC RELAY	R6T	THERMISTOR (HEAT EX. OF SUBCOOL INLET)	Z1C~10C	NOISE FILTER (FERRITE CORE)
K2M, K4M	MAGNETIC CONTACTOR (M1C)	RY1	MAGNETIC RELAY (A9P)	Z1F	NOISE FILTER (WITH SURGE ABSORBER) (A2P)
K2M, K3M	MAGNETIC CONTACTOR (M2C, M3C)	S1NPH	PRESSURE SENSOR (HIGH)		
K1R, K2R	MAGNETIC RELAY (K2M, K3M)	S1NPL	PRESSURE SENSOR (LOW)		

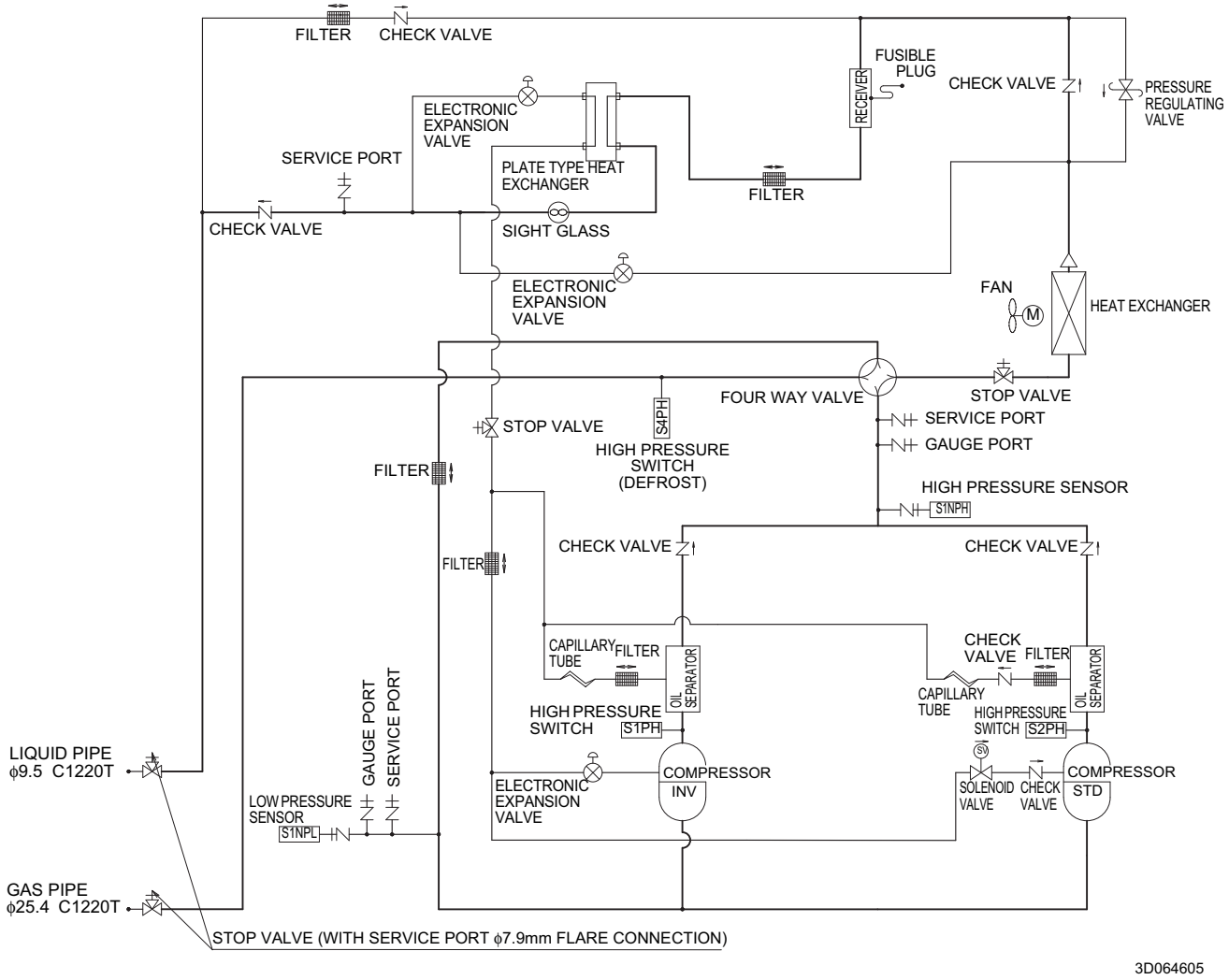
2.5 Piping Diagram

LRLEQ5A, 6AY1(E)
LRMEQ5A, 6AY1(E)

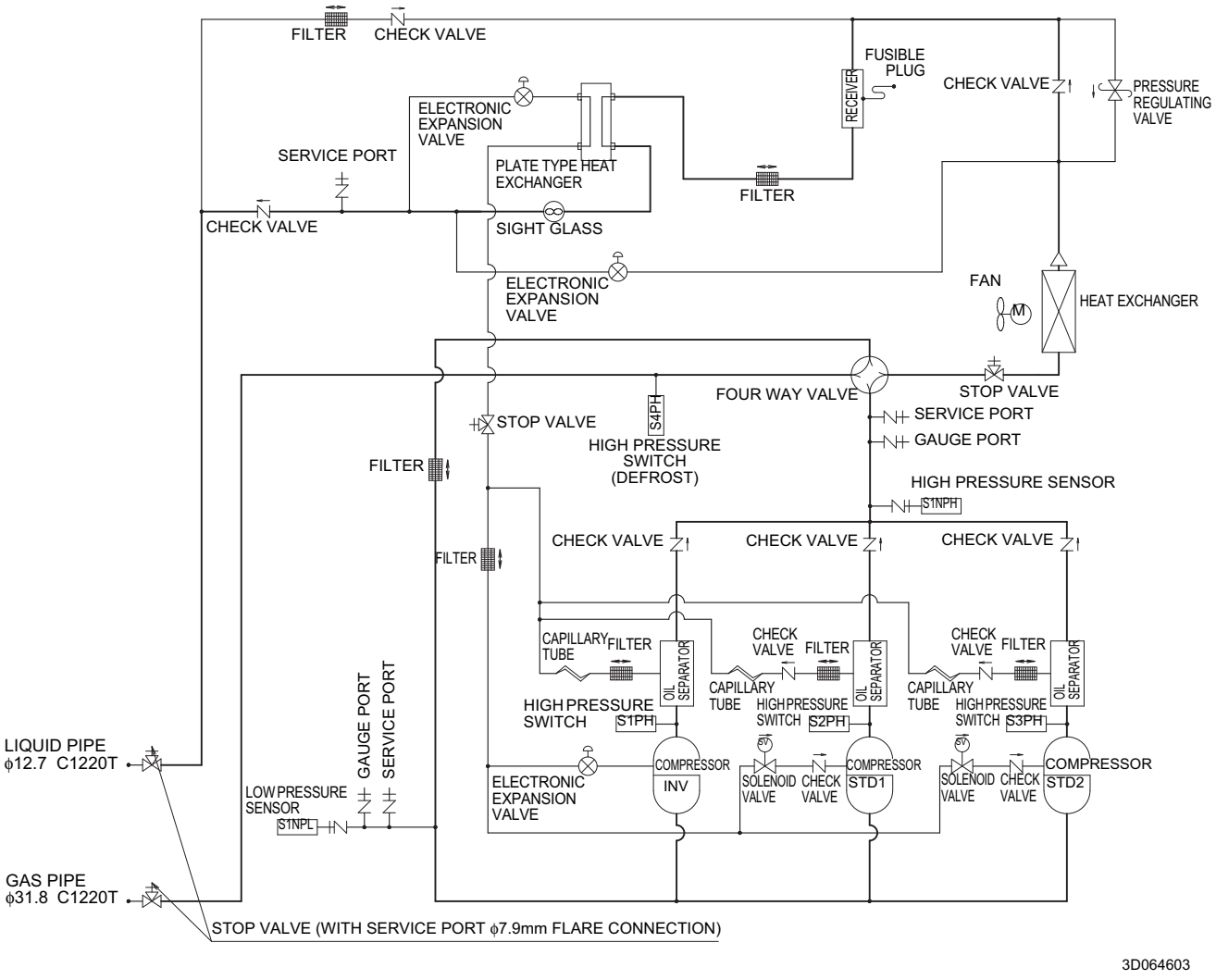


3D064606A

LRLEQ8A, 10A, 12AY1(E)
LRMEQ8A, 10A, 12AY1(E)



LRLEQ15A, 20AY1(E)
LRMEQ15A, 20AY1(E)



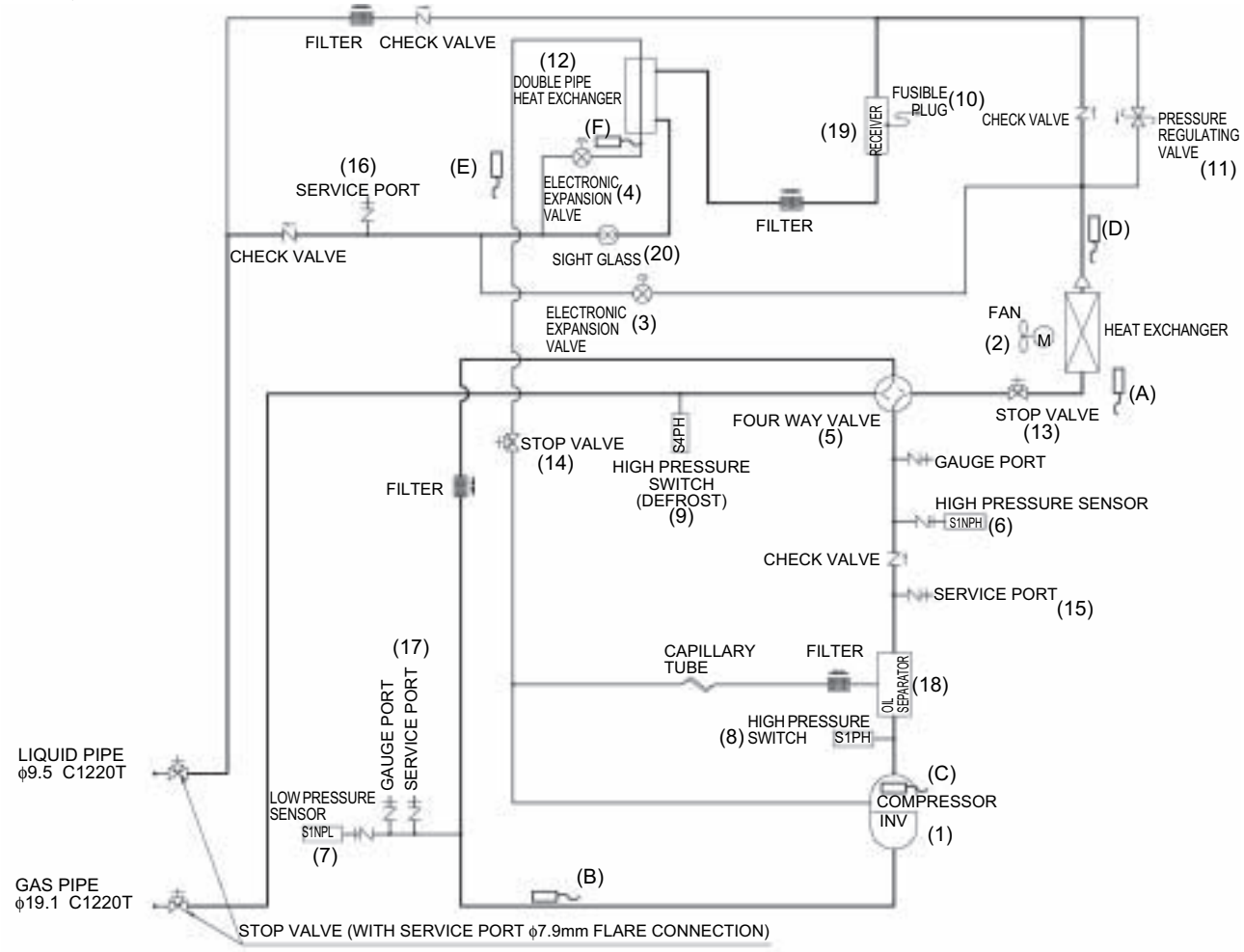
3D064603

2.6 Description and Layout of Functional Parts and Piping Diagram

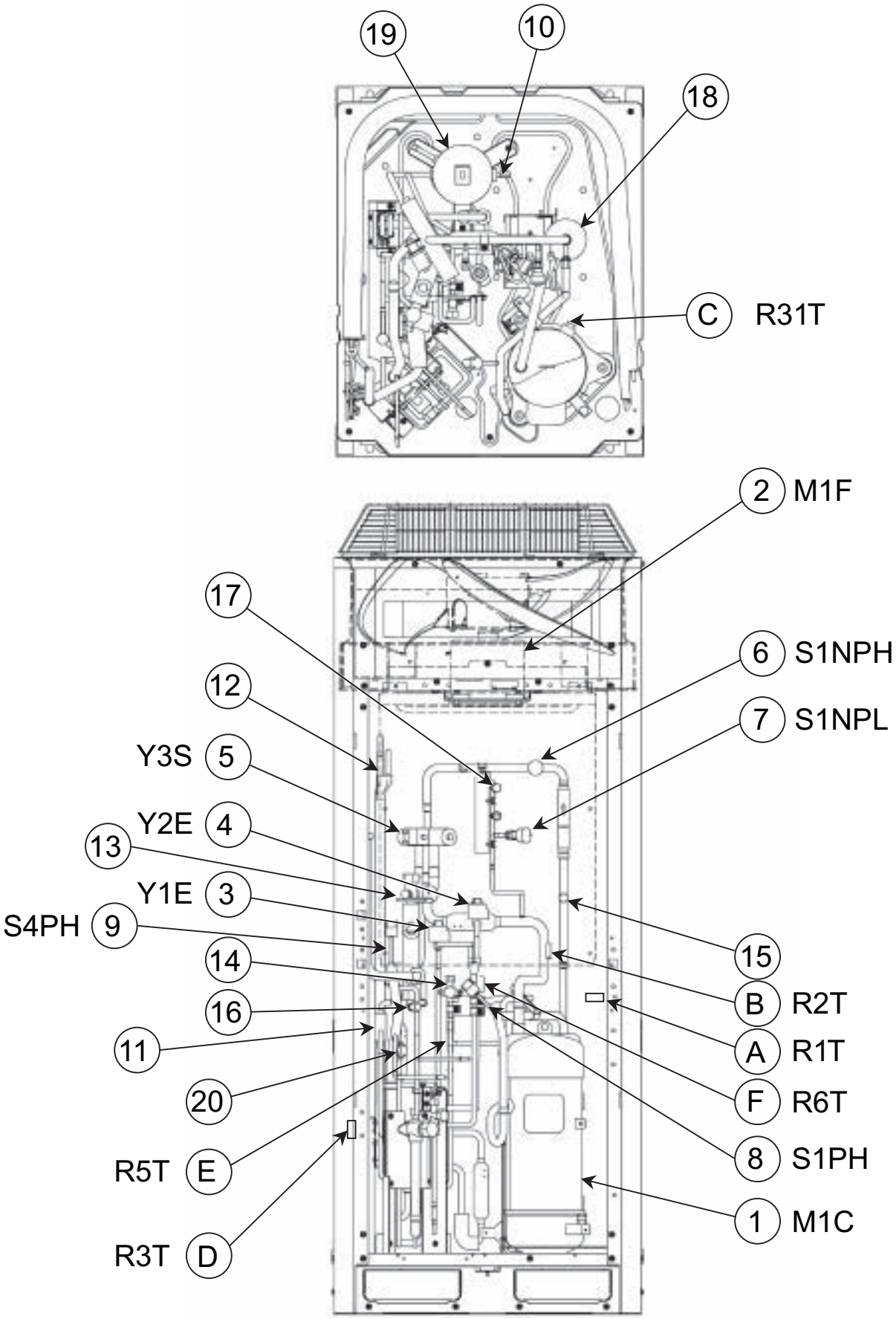
LRMEQ5, 6AY1
LRLEQ5, 6AY1

No.	Name	Symbol	Function
1	Inverter compressor (INV)	M1C	An inverter-driven compressor, which runs at operating frequencies in the range of 52Hz to 218Hz.
2	Fan motor	M1F	Used to operate a fan for heat exchange through an air heat exchanger.
3	Electronic expansion valve (Main: EV1)	Y1E	Not used.
4	Electronic expansion valve (Injection: EV2)	Y2E	Used to control the injection flow rate and the compressor overheat protection.
5	Four way valve	Y3S	Not used.
6	High pressure sensor	S1NPH	Used to detect high pressure.
7	Low pressure sensor	S1NPL	Used to detect low pressure.
8	High pressure switch	S1PH	In order to prevent the increase of high pressure when a malfunction occurs, this switch activated at high pressure of 3.8MPa or more to stop the compressor operation.
9	High pressure switch	S4PH	Not used.
10	Fusible plug	—	When the refrigerant of the receiver unit reaches a temperature of 70°C to 75°C, the fusible head of plug will melt, thus discharging the refrigerant of high temperature and high pressure.
11	Pressure regulating valve	—	Opens when the pressure reaches 4.0 MPa. This prevents an excessive pressure rise caused by the pipes being completely filled with liquid when not in operation.
12	Double pipe heat exchanger	—	Used to cool the liquid refrigerant from the liquid receiver.
13	Stop valve (Heat exchanger on primary side)	—	Used to service.
14	Stop valve (Double pipe heat exchanger on secondary side)	—	Used to service.
15	Service port	—	For gas (high pressure).
16	Service port	—	For liquid (high pressure).
17	Service port	—	For gas (low pressure).
18	Oil separator	—	Refrigerant gas discharged from the compressor contains lubricating oil in the compressor. If the amount of this lubricating oil is large, the oil quantity in the compressor will become short, which may result in defective lubrication. Furthermore, this oil stains the heat transfer surface of condenser or evaporator and reduces the effectiveness of the heat exchanger. To avoid that, an oil separator is installed in close proximity to the discharge pipe of the compressor, where oil is separated and collected to return to the compressor.
19	Liquid receiver	—	Used to compensate the variations in handling of refrigerant, thus providing stable operating conditions at all times. In order to repair in the refrigerant circuit, this receiver collects the refrigerant and facilitates the repairing of the parts.
20	Sight glass	—	Used to test run and service.
A	Thermistor (Outdoor air: Ta)	R1T	Used to detect the outdoor temperature and control the fan operation.
B	Thermistor (Suction pipe: Ti)	R2T	Used to detect the suction pipe temperature of M1C compressor and protect this compressor.
C	Thermistor (INV discharge pipe: Td1)	R31T	Used to detect the discharge pipe temperature of M1C compressor and control over discharge pipe temperature of this compressor for protection.
D	Thermistor (Heat exchanger deicer: Tce)	R3T	Not used.
E	Thermistor (Double pipe heat exchanger outlet: Tg)	R5T	Used to detect the gas temperature at evaporator side of double pipe heat exchanger, and keep the constant overheated degree of double pipe heat exchanger.
F	Thermistor (Double pipe heat exchanger inlet: TL)	R6T	Used to detect the gas saturation temperature at evaporator side of double pipe heat exchanger.

LRMEQ5, 6AY1
LRLEQ5, 6AY1



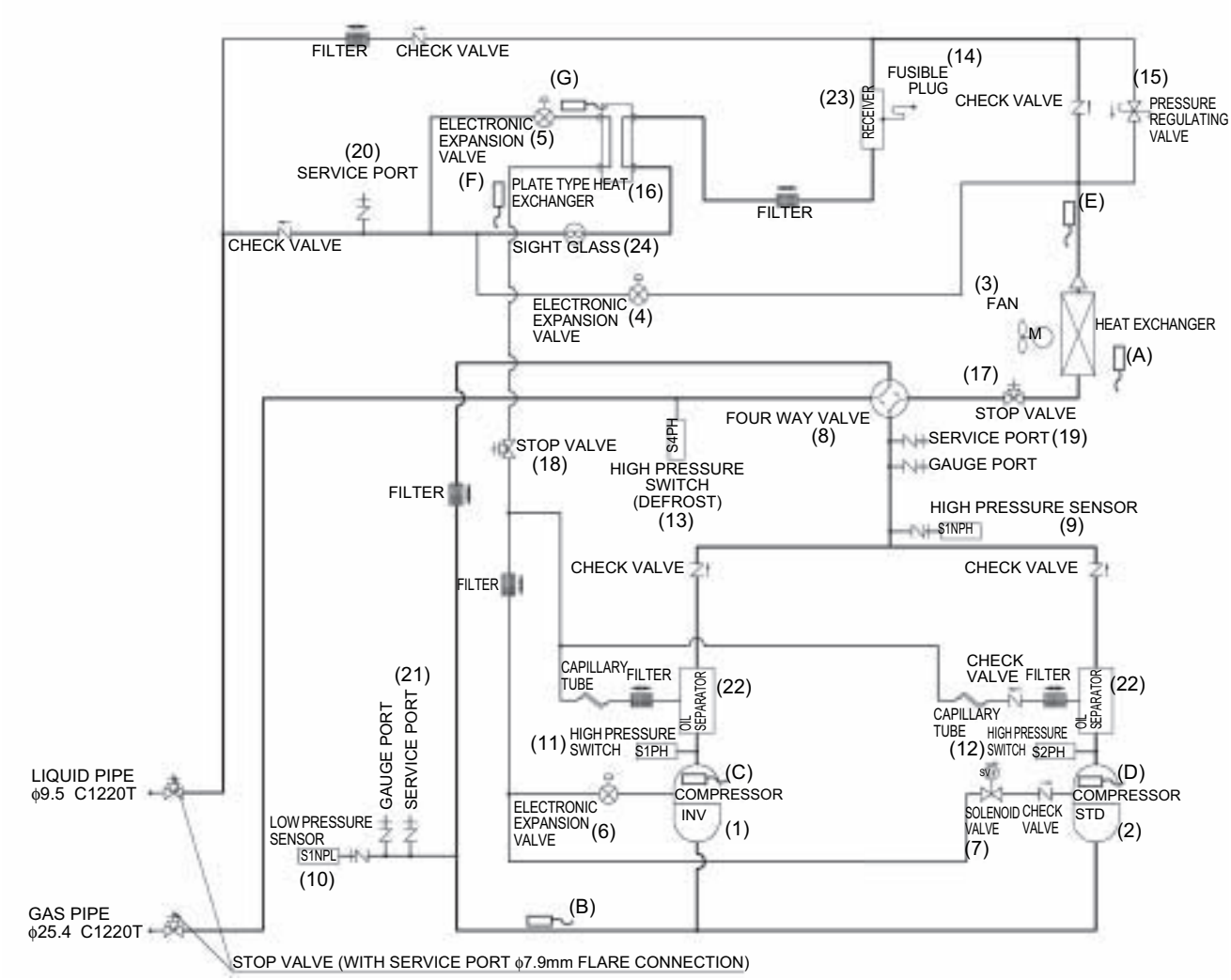
LRMEQ5, 6AY1
LRLEQ5, 6AY1



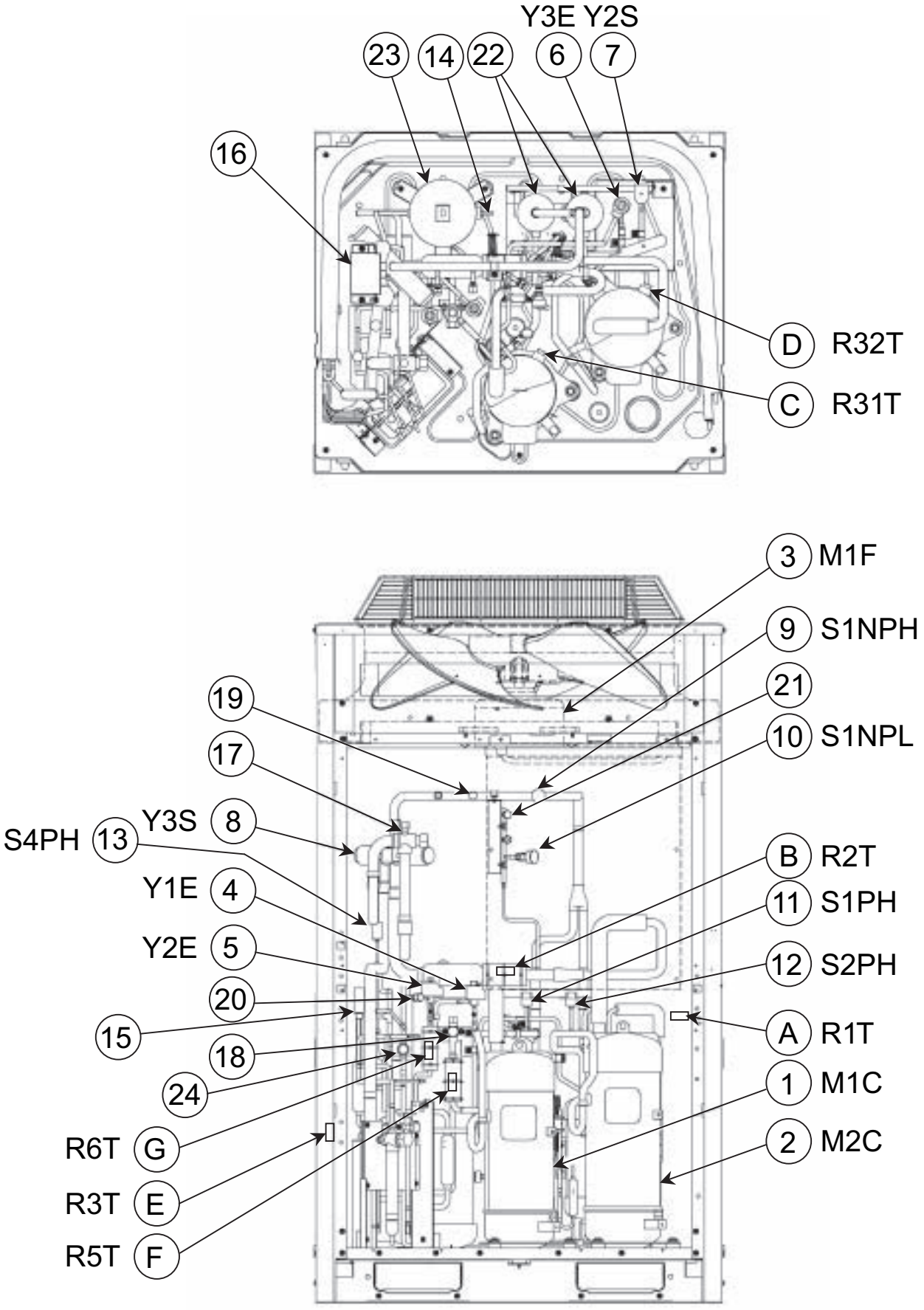
LRMEQ8, 10, 12AY1
LRLEQ8, 10, 12AY1

No.	Name	Symbol	Function
1	Inverter compressor (INV)	M1C	An inverter-driven compressor, which runs at operating frequencies in the range of 52Hz to 232Hz.
2	Standard compressor (STD)	M2C	A compressor, which runs with commercial power supply.
3	Fan motor	M1F	Used to operate a fan for heat exchange through an air heat exchanger.
4	Electronic expansion valve (Main: EV1)	Y1E	Not used.
5	Electronic expansion valve (Injection: EV2)	Y2E	Used to control the injection flow rate and the compressor overheat protection.
6	Electronic expansion valve (M1C: EV3)	Y3E	Returns the oil to the inverter compressor and creates a gas-injection economizer circuit. In addition, this controls the difference in discharge pipe temperatures between INV compressor and STD compressor.
7	Solenoid valve	Y2S	Returns the oil to the M2C and creates a gas-injection economizer circuit.
8	Four way valve	Y3S	Not used.
9	High pressure sensor	S1NPH	Used to detect high pressure.
10	Low pressure sensor	S1NPL	Used to detect low pressure.
11	High pressure switch (for INV)	S1PH	In order to prevent the increase of high pressure when a malfunction occurs, this switch activated at high pressure of 3.8MPa or more to stop the compressor operation.
12	High pressure switch (for STD)	S2PH	
13	High pressure switch	S4PH	Not used.
14	Fusible plug	—	When the refrigerant of the receiver unit reaches a temperature of 70°C to 75°C, the fusible head of plug will melt, thus discharging the refrigerant of high temperature and high pressure.
15	Pressure regulating valve	—	Opens when the pressure reaches 4.0 MPa. This prevents an excessive pressure rise caused by the pipes being completely filled with liquid when not in operation.
16	Plate type heat exchanger	—	Used to cool the liquid refrigerant from the liquid receiver.
17	Stop valve (Heat exchanger on primary side)	—	Used to service.
18	Stop valve (Double pipe heat exchanger on secondary side)	—	Used to service.
19	Service port	—	For gas (high pressure).
20	Service port	—	For liquid (high pressure).
21	Service port	—	For gas (low pressure).
22	Oil separator	—	Refrigerant gas discharged from the compressor contains lubricating oil in the compressor. If the amount of this lubricating oil is large, the oil quantity in the compressor will become short, which may result in defective lubrication. Furthermore, this oil stains the heat transfer surface of condenser or evaporator and reduces the effectiveness of the heat exchanger. To avoid that, an oil separator is installed in close proximity to the discharge pipe of the compressor, where oil is separated and collected to return to the compressor.
23	Liquid receiver	—	Used to compensate the variations in handling of refrigerant, thus providing stable operating conditions at all times. In order to repair in the refrigerant circuit, this receiver collects the refrigerant and facilitates the repairing of the parts.
24	Sight glass	—	Used to test run and service.
A	Thermistor (Outdoor air: Ta)	R1T	Used to detect the outdoor temperature and control the fan operation.
B	Thermistor (Suction pipe: Ti)	R2T	Used to detect the suction pipe temperature of M1C and M2C compressor and protect this compressor.
C	Thermistor (INV discharge pipe: Td1)	R31T	Used to detect the discharge pipe temperature of M1C compressor and control over discharge pipe temperature of this compressor for protection.
D	Thermistor (STD discharge pipe: Td2)	R32T	Used to detect the discharge pipe temperature of M2C compressor and control over discharge pipe temperature of this compressor for protection.
E	Thermistor (Heat exchanger deicer: Tce)	R3T	Not used.
F	Thermistor (Plate type heat exchanger outlet: Tg)	R5T	Used to detect the gas temperature at evaporator side of double pipe heat exchanger, and keep the constant overheated degree of double pipe heat exchanger.
G	Thermistor (Plate type heat exchanger inlet: TL)	R6T	Used to detect the gas saturation temperature at evaporator side of double pipe heat exchanger.

LRMEQ8, 10, 12AY1
LRLEQ8, 10, 12AY1



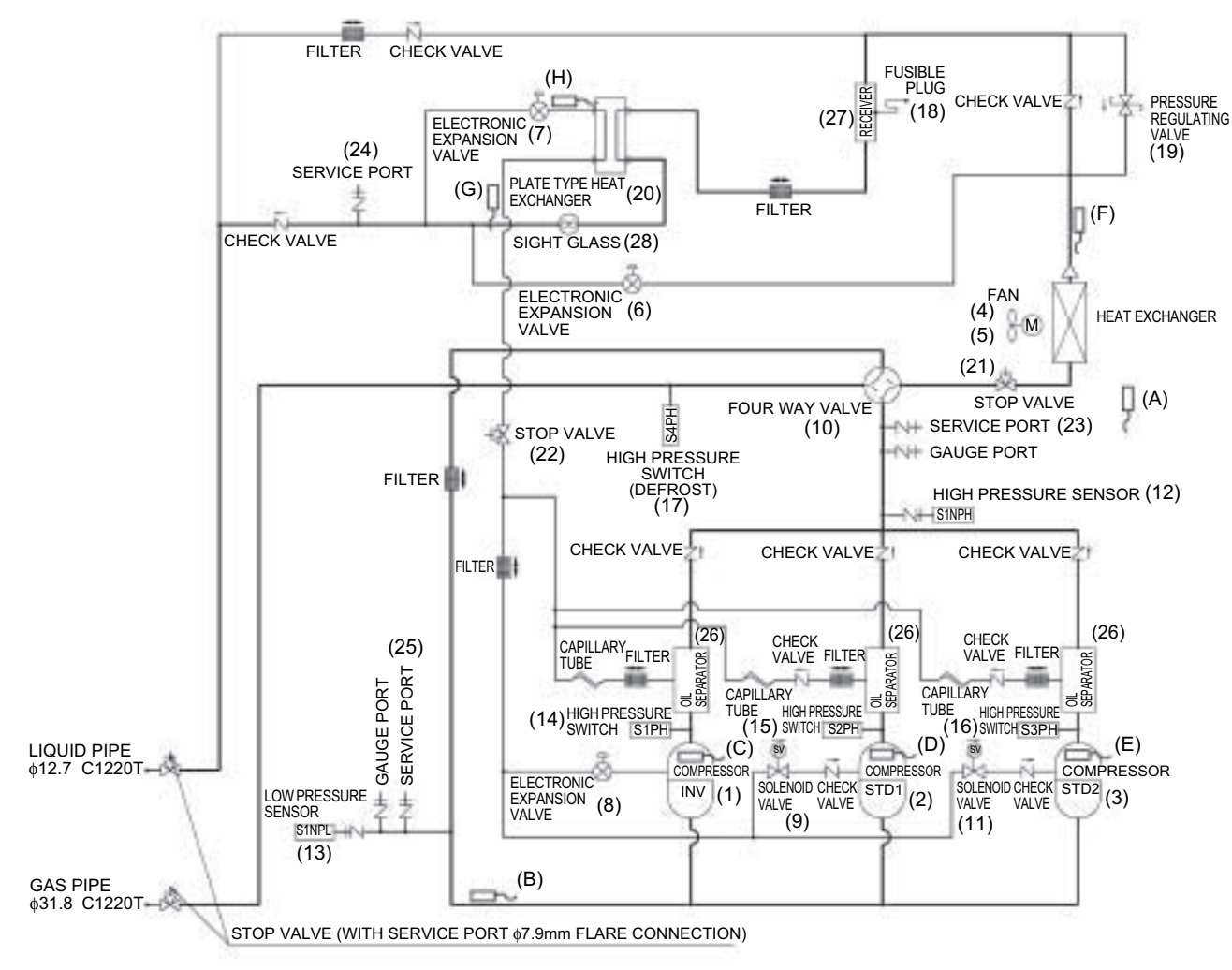
LRMEQ8, 10, 12AY1
LRLEQ8, 10, 12AY1



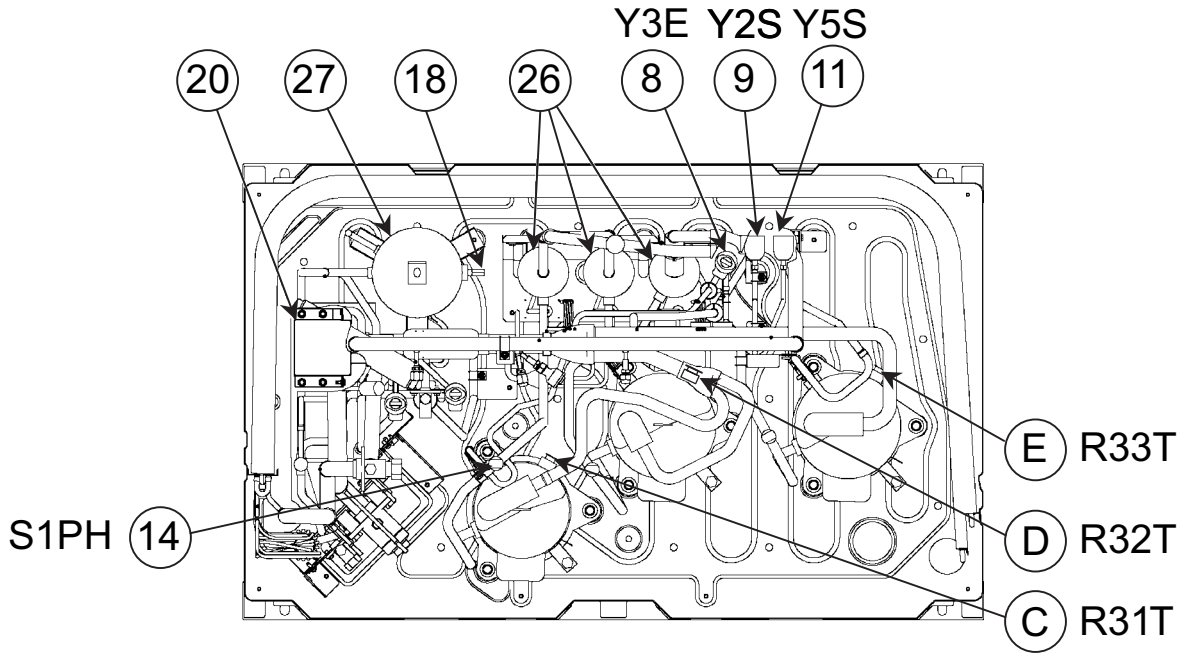
LRMEQ15, 20AY1
LRLEQ15, 20AY1

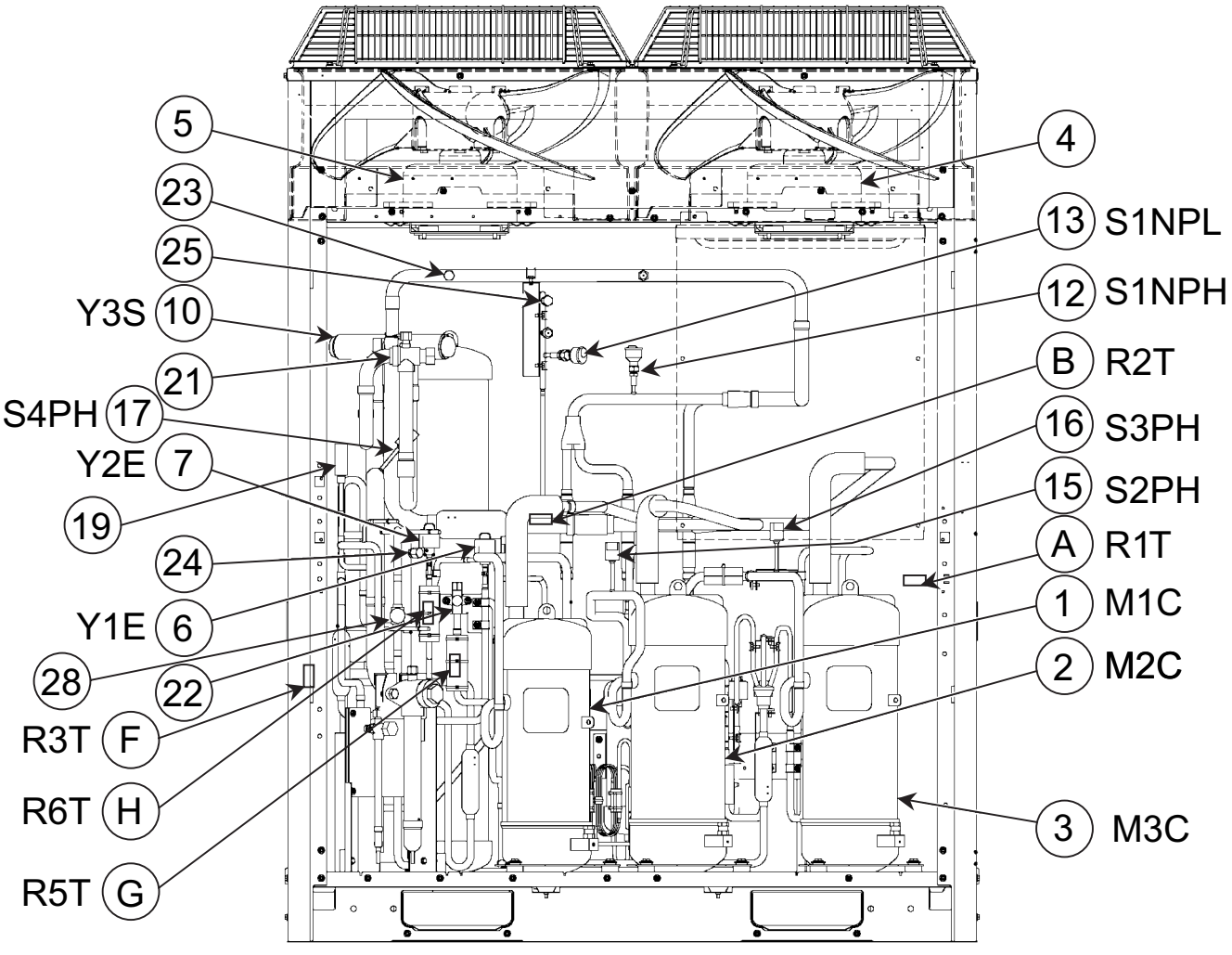
No.	Name	Symbol	Function
1	Inverter compressor (INV)	M1C	An inverter-driven compressor, which runs at operating frequencies in the range of 52Hz to 232Hz.
2	Standard compressor (STD 1)	M2C	A compressor, which runs with commercial power supply.
3	Standard compressor (STD 2)	M3C	
4	Fan motor	M1F	Used to operate a fan on the right for heat exchange through an air heat exchanger.
5	Fan motor	M2F	Used to operate a fan on the left for heat exchange through an air heat exchanger.
6	Electronic expansion valve (Main: EV1)	Y1E	Not used.
7	Electronic expansion valve (Injection: EV2)	Y2E	Used to control the injection flow rate and the compressor overheat protection.
8	Electronic expansion valve (M1C: EV3)	Y3E	Returns the oil to the inverter compressor and creates a gas-injection economizer circuit. In addition, this controls the difference in discharge pipe temperatures between INV compressor and STD compressor.
9	Solenoid valve	Y2S	Returns the oil to the M2C and creates a gas-injection economizer circuit.
10	Four way valve	Y3S	Not used.
11	Solenoid valve	Y5S	Returns the oil to the M3C and creates a gas-injection economizer circuit.
12	High pressure sensor	S1NPH	Used to detect high pressure.
13	Low pressure sensor	S1NPL	Used to detect low pressure.
14	High pressure switch (for INV)	S1PH	In order to prevent the increase of high pressure when a malfunction occurs, this switch activated at high pressure of 3.8MPa or more to stop the compressor operation.
15	High pressure switch (for STD 1)	S2PH	
16	High pressure switch (for STD 2)	S3PH	
17	High pressure switch	S4PH	Not used.
18	Fusible plug	—	When the refrigerant of the receiver unit reaches a temperature of 70°C to 75°C, the fusible head of plug will melt, thus discharging the refrigerant of high temperature and high pressure.
19	Pressure regulating valve	—	Opens when the pressure reaches 4.0 MPa. This prevents an excessive pressure rise caused by the pipes being completely filled with liquid when not in operation.
20	Plate type heat exchanger	—	Used to cool the liquid refrigerant from the liquid receiver.
21	Stop valve (Heat exchanger on primary side)	—	Used to service.
22	Stop valve (Double pipe heat exchanger on secondary side)	—	Used to service.
23	Service port	—	For gas (high pressure).
24	Service port	—	For liquid (high pressure).
25	Service port	—	For gas (low pressure).
26	Oil separator	—	Refrigerant gas discharged from the compressor contains lubricating oil in the compressor. If the amount of this lubricating oil is large, the oil quantity in the compressor will become short, which may result in defective lubrication. Furthermore, this oil stains the heat transfer surface of condenser or evaporator and reduces the effectiveness of the heat exchanger. To avoid that, an oil separator is installed in close proximity to the discharge pipe of the compressor, where oil is separated and collected to return to the compressor.
27	Liquid receiver	—	Used to compensate the variations in handling of refrigerant, thus providing stable operating conditions at all times. In order to repair in the refrigerant circuit, this receiver collects the refrigerant and facilitates the repairing of the parts.
28	Sight glass	—	Used to test run and service.
A	Thermistor (Outdoor air: Ta)	R1T	Used to detect the outdoor temperature and control the fan operation.
B	Thermistor (Suction pipe: Ti)	R2T	Used to detect the suction pipe temperature of M1C~M3C compressor and protect this compressor.
C	Thermistor (INV discharge pipe: Td1)	R31T	Used to detect the discharge pipe temperature of M1C compressor and control over discharge pipe temperature of this compressor for protection.
D	Thermistor (STD 1 discharge pipe: Td2)	R32T	Used to detect the discharge pipe temperature of M2C compressor and control over discharge pipe temperature of this compressor for protection.
E	Thermistor (STD 2 discharge pipe: Td3)	R33T	Used to detect the discharge pipe temperature of M3C compressor and control over discharge pipe temperature of this compressor for protection.
F	Thermistor (Heat exchanger deicer: Tce)	R3T	Not used.
G	Thermistor (Plate type heat exchanger outlet: Tg)	R5T	Used to detect the gas temperature at evaporator side of double pipe heat exchanger, and keep the constant overheated degree of double pipe heat exchanger.
H	Thermistor (Plate type heat exchanger inlet: TL)	R6T	Used to detect the gas saturation temperature at evaporator side of double pipe heat exchanger.

LRMEQ15, 20AY1
LRLEQ15, 20AY1



LRMEQ15, 20AY1
LRLEQ15, 20AY1





3. Field Settings

3.1 Field Setting From Outdoor Unit

The target evaporation temperature can be calculated as follows:
Tst : Target evaporation temperature
Tsd : Evaporation temperature set by dip switches
ΔTsp: Temperature correction setting by pushbuttons.
ΔTsn: Temperature correction setting during night-time operation

$$Tst = Tsd + \Delta Tsp + \Delta Tsn$$

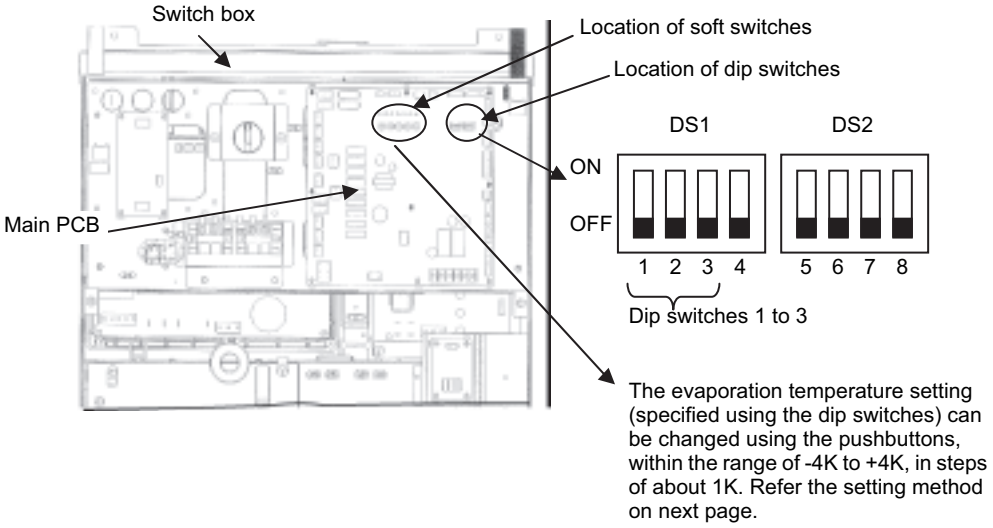
The evaporation temperature can be set by dip switches and pushbuttons on the outdoor unit PCB.
The dip switches can be set when the power is turned off, while the pushbuttons can be set while the condensing unit is operating.
Note that the actual evaporation temperature may be lower than that specified, if the outdoor temperature is too low. (This is intended to protect the compressors.)
Do not set the evaporation temperature to less than the values below. (This may damage the compressors.)
MT series : -20°C
LT series : -45°C

(1) Field settings by dip switches

Be sure to turn off the power before changing the DIP switch settings.

DS1-1 to 3 enable setting the saturated temperature equivalent to suction pressure (in increments of 5°C).

Do not change the settings of DS1-4, DS2-1 to 4.



DS1	Tsd	
	LRMEQ**	LRLEQ**
ON OFF 1 2 3 4 Factory set	-10°C (0.47MPa)	-35°C (0.11MPa)
ON OFF 1 2 3 4	-20°C (0.29MPa)	-45°C (0.03MPa)
ON OFF 1 2 3 4	-15°C (0.37MPa)	-40°C (0.07MPa)
ON OFF 1 2 3 4	-5°C (0.56MPa)	-30°C (0.16MPa)

DS1	Tsd	
	LRMEQ**	LRLEQ**
ON OFF 1 2 3 4	0°C (0.69MPa)	-25°C (0.22MPa)
ON OFF 1 2 3 4	5°C (0.82MPa)	-20°C (0.29MPa)
ON OFF 1 2 3 4	10°C (0.98MPa)	

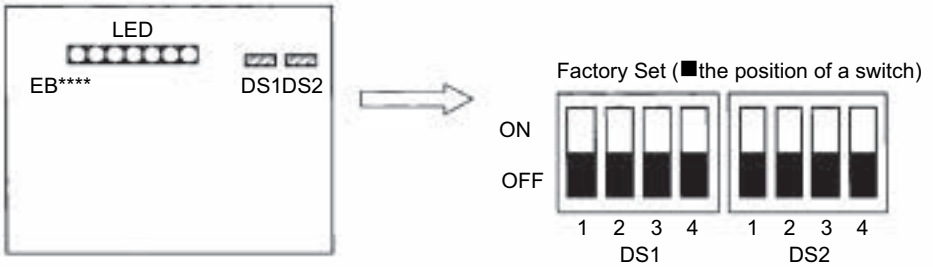
Tsd: The evaporation temperature set by the dip switches.

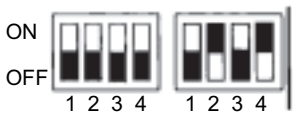
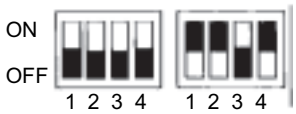
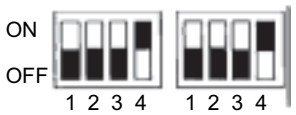
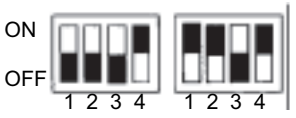
Setting at replacement by spare PCB

Caution DIP switch setting after changing the main PCB to spare parts PCB

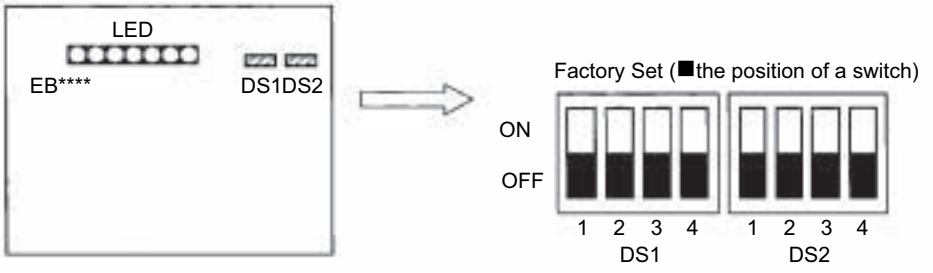
In case of repair using this part, replace the part according to the following instruction. Make the following capacity and refrigeration / freezing settings subject to application models.
Cut the power supply of the outdoor unit once and switch it on again after setting the switch of subject.

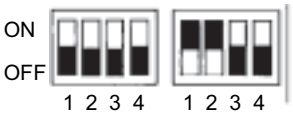
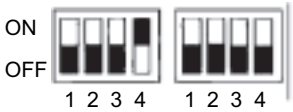
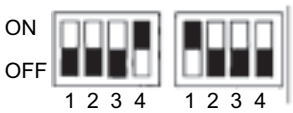
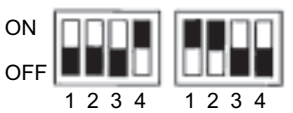
■ Freezer: LRLEQ5~20AY1 (E)



Applicable model	Setting method (■the position of switches)	
LRLEQ5AY1 (E)		Set DS2-2 and DS2-4 to ON
LRLEQ6AY1 (E)		Set DS2-1 and DS2-4 to ON
LRLEQ8AY1 (E)		Set DS2-1, DS2-2 and DS2-4 to ON
LRLEQ10AY1 (E)		Set DS1-4 and DS2-4 to ON
LRLEQ12AY1 (E)		Set DS1-4, DS2-2 and DS2-4 to ON
LRLEQ15AY1 (E)		Set DS1-4, DS2-1 and DS2-4 to ON
LRLEQ20AY1 (E)		Set DS1-4, DS2-1, DS2-2 and DS2-4 to ON

■ Refrigerator: LRMEQ5~20AY1 (E)



Applicable model	Setting method (■the position of switches)	
LRMEQ5AY1 (E)		Set DS2-2 to ON
LRMEQ6AY1 (E)		Set DS2-1 to ON
LRMEQ8AY1 (E)		Set DS2-1 and DS2-2 to ON
LRMEQ10AY1 (E)		Set DS1-4 to ON
LRMEQ12AY1 (E)		Set DS1-4 and DS2-2 to ON
LRMEQ15AY1 (E)		Set DS1-4 and DS2-1 to ON
LRMEQ20AY1 (E)		Set DS1-4, DS2-1 and DS2-2 to ON

(2) Setting in service mode

Using pushbuttons on the Main PCB (A1P) enables a variety of settings shown below.

The following 4 modes are available.

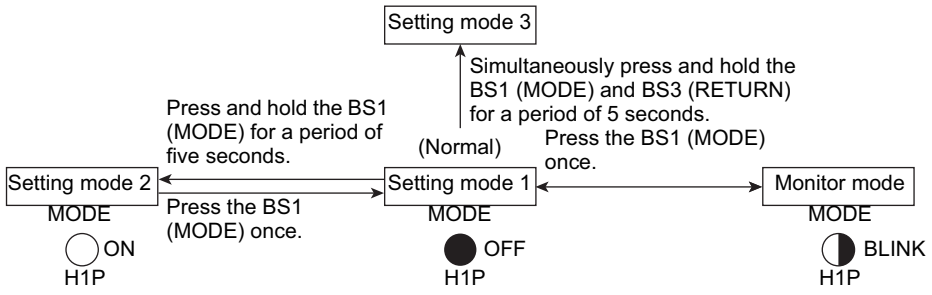
a. Setting mode 1 ..... Initial state (while in normal operation): (H1P: OFF)
Used to make setting of the method of "Cool/Heat selection".
This mode is displayed while in "malfunction", "low noise control", and "demand control" as well.

b. Setting mode 2
Setting mode 3 ..... Used to make changes of operating conditions or settings of a variety of addresses, mainly for service work.
(H1P: ON)

c. Monitor mode ..... Used to check the contents set in Setting mode 2.
(H1P: BLINK)

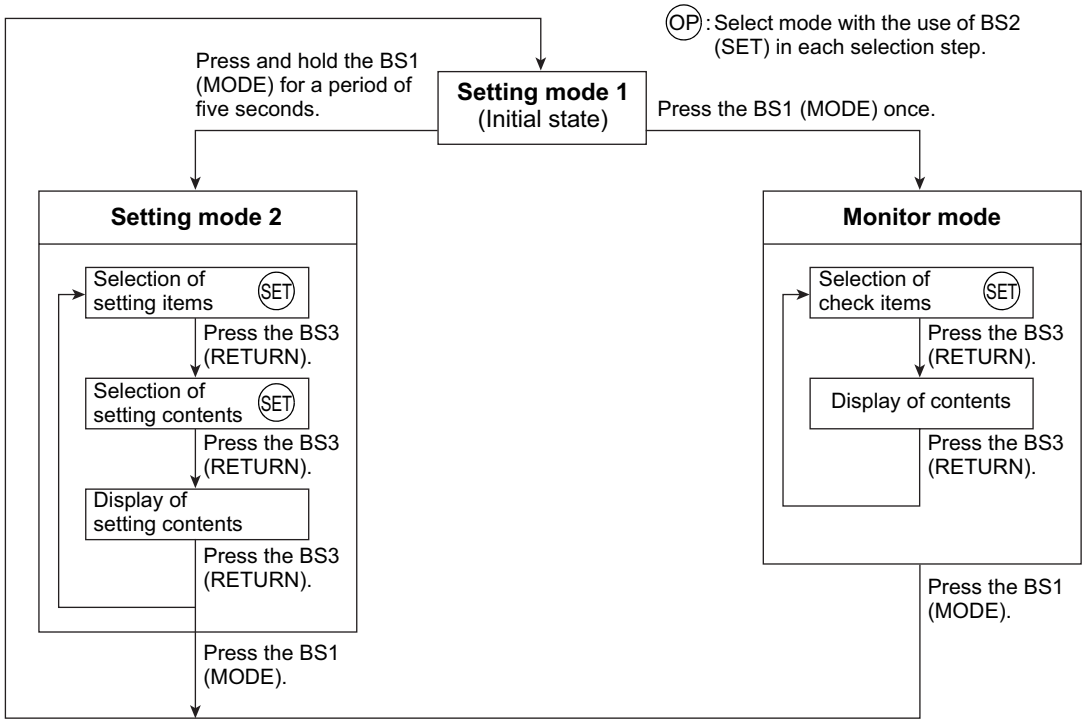
■ **Procedure for changing mode**

While in each mode, use the MODE button to change settings as shown below.



■ **Steps to change mode**

Caution Turn off the RUN switch of the outdoor unit in case of the setting.



■ **LED display when power is on**

H2P blinks for the first five seconds when the power supply is turned on.
If the equipment is normal, H2P will be turned off in five seconds.
H2P lights for abnormality.

○: ON ●: OFF ◑: BLINK

No.	H1P	H2P	H3P	H4P	H5P	H6P	H7P
1	●	◑	○	●	●	●	●

(Immediately after power on)

⇩

No.	H1P	H2P	H3P	H4P	H5P	H6P	H7P
1	●	●	○	●	●	●	●

(5 seconds after power on)

b-1. Setting mode 2

No.	Setting item	H1P	H2P	H3P	H4P	H5P	H6P	H7P	Display of setting conditions
0	ΔTsp: Fine-tuning setting of evaporation temperature	○	●	●	●	●	●	●	ΔTsp: 0K (Factory set) ○ ● ● ● ● ● ●; -1°C ○ ● ● ● ● ● ○; -2°C ○ ● ● ● ● ○ ●; -3°C ○ ● ● ● ● ○ ○; -4°C ○ ● ● ● ○ ● ●; -5°C ○ ● ● ● ○ ● ○; +1°C ○ ● ● ● ○ ○ ●; +2°C ○ ● ● ● ○ ○ ○; +3°C ○ ● ● ○ ● ● ●; +4°C ○ ● ● ○ ● ● ○; +5°C ○ ● ● ○ ● ○ ●
2	Current limitation setting	○	●	●	●	●	○	●	LRM(L)EQ 5,6AY1 / 8,10,12AY1 / 15,20AY1: No limitation. (Factory set) ○ ● ● ● ● ● ○; 10A 20A 36A ○ ● ● ● ● ○ ●; 9A 18A 30A ○ ● ● ● ○ ● ●; 7A 14A 27A ○ ● ● ○ ● ● ●
3	Setting of limit value of outdoor fan taps	○	●	●	●	●	○	○	(Factory set) ○ ● ● ● ● ● ○; Setting 1 ○ ● ● ● ● ○ ●; Setting 2 ○ ● ● ● ○ ● ●; Setting 3 ○ ● ● ○ ● ● ●; Setting 4 ○ ● ○ ● ● ● ●; Setting 5 ○ ○ ● ● ● ● ●. Details depend on the following.(*1)
5	Setting of external low noise operation (Tax1, 2 and Tay1, 2 are set by setting 2-21.)	○	●	●	●	○	●	○	6 (Tamb≤Tax1) 7(Tay1<Tamb≤Tax2) 9(Tamb<Tay2) (Factory set) ○ ● ● ● ● ● ○; 5(Tamb≤Tax1) 6(Tay1<Tamb≤Tax2) 9(Tamb<Tay2) ○ ● ● ● ● ○ ●
6	AIRNET address	○	●	●	●	○	○	●	(Factory set) 0 ○ ● ● ● ● ● ●; 1 ○ ● ● ● ● ○ ○; ~; 63 ○ ● ○ ○ ○ ○ ○. Please give the address of 1 or more when you do the AIRNET. Binary system for address(six digits)
7	Setting of night-time low noise operation (Only connected to AIRNET)	○	●	●	●	○	○	○	Standard setting / High static pressure setting: 9/9 ○ ● ● ● ● ● ○; 8/7 ○ ● ● ● ● ○ ●; 7/8 ○ ● ● ● ○ ● ●; 6/6 ○ ● ● ○ ● ● ●; 5/5 ○ ● ○ ● ● ● ●; 4/4 ○ ○ ● ● ● ● ●
8	Night-time low noise start setting. It uses it for setting 2-7 and 2-11. (Only connected to AIRNET)	○	●	●	○	●	●	●	21:00 (Factory set) ○ ● ● ● ● ● ○; 22:00 ○ ● ● ● ● ○ ●; 23:00 ○ ● ● ● ○ ● ●; 20:00 ○ ● ● ○ ● ● ●
9	Night-time low noise end setting. It uses it for setting 2-7 and 2-11. (Only connected to AIRNET)	○	●	●	○	●	●	○	7:00 (Factory set) ○ ● ● ● ● ● ○; 8:00 ○ ● ● ● ● ○ ●; 9:00 ○ ● ● ● ○ ● ●; 6:00 ○ ● ● ○ ● ● ●
11	ΔTsn: Evaporation temperature correction setting during operation at night-time	○	●	●	○	●	○	○	+1°C(Factory set) ○ ● ● ● ● ● ○; +2°C ○ ● ● ● ● ○ ●; +3°C ○ ● ● ● ○ ● ●; 0°C ○ ● ● ○ ● ● ●. As for Factory set, time zone between 2-8 and 2-9 becomes effective for setting.
21	Setting of external temperature of outdoor fan tap It uses it by setting 2-5.	○	●	●	○	○	●	○	Tax1 Tay1 Tax2 Tay2: 26°C 28°C 31°C 33°C ○ ● ● ● ● ● ○; 20°C 22°C 26°C 28°C ○ ● ● ● ● ○ ●; 27°C 29°C 32°C 34°C ○ ● ● ● ○ ● ●
40	Setting of high static pressure of outdoor fan	○	●	○	●	●	●	○	Standard setting (Factory set) ○ ● ● ● ● ● ○; High static pressure setting ○ ● ● ● ● ○ ●

The number in the "No." column represent the number of times to press the SET (BS2) button.

(*1)

	Standard setting		High static pressure setting	
Model name	LRM(L)EQ6,12,20AY1	LRM(L)EQ5,8,10,15,20AY1	LRM(L)EQ6,12,15,20AY1	LRM(L)EQ5,8,10AY1
Factory set	9	9	8	8
Setting 1	8	10	7	9
Setting 2	7	8	6	7
Setting 3	6	7	5	6
Setting 4	5	6	5	5
Setting 5	5	5	5	5

b-2. Setting mode 2 (for service)

No.	Setting item	H1P	H2P	H3P	H4P	H5P	H6P	H7P	Display of setting conditions
4	INV compressor max. frequency step control	○	●	●	●	○	●	●	Compressor step control: 5A 6A 8A 10A 12A 15A 20A — 15 21 34 39 42 58 62 / 14 18 38 36 38 62 58 / 13 17 42 42 36 57 / 21 40 60 / 16 36 56 / 15 35 55 / 14 34 54 (Factory set)
10	Setting of night-time compressor frequency reduction Set the start time with 2-8, set the end time with 2-9.	○	●	●	○	●	○	●	Compressor steps (Factory set) Setting step: 1 — Setting step: 2 Setting step: 2 — Setting step: 4 Setting step: 3 — Setting step: 6 Setting step: 4 — Setting step: 8 Setting step: 5 — Setting step: 10 Setting step: 6 — Setting step: 12
14	Correction of fan revolution according to the high pressure	○	●	●	○	○	○	●	High pressure correction = 0 (Factory set) High pressure correction = -0.2 High pressure correction = 0.2 High pressure correction = 0.4 High pressure correction = 0.6
19	Oil recovery continuous operation time	○	●	○	●	●	○	○	40 min. (Factory set) 30 min. 20 min.
20	Speed change for cooling capacity reduction	○	●	○	●	○	●	●	30 sec. (Factory set) 10 sec.
27	INV compressor forced stop	○	●	○	○	●	○	○	Normal control (Factory set) Inverter compressor forced stop To reset the compressor after a forced stop, turn the power off and back on again.
43	STD1 compressor forced stop	○	○	●	○	●	○	○	Normal control (Factory set) STD1 compressor forced stop To reset the compressor after a forced stop, turn the power off and back on again.
44	STD2 compressor forced stop	○	○	●	○	○	●	●	Normal control (Factory set) STD2 compressor forced stop To reset the compressor after a forced stop, turn the power off and back on again.

c. Setting mode 3 (for servicing)

No.	Setting item	H1P	H2P	H3P	H4P	H5P	H6P	H7P	Display of setting conditions
3-21	Changing the compressor steps during target oil recovery	○	○	●	○	○	●	●	Compressor frequency: 5A, 6A — 13; 8A, 10A, 12A — 27; 15A, 20A — 34 (Factory set) / 17 31 42

c. Setting mode 3 (for servicing)

Check when malfunction code “PJ” is displayed.

No.	Setting item	H1P	H2P	H3P	H4P	H5P	H6P	H7P	Display of setting conditions
3-10	Capacity setting	○	●	●	○	●	○	●	LRM(L)EQ5AY1 LRM(L)EQ6AY1 LRM(L)EQ8AY1 LRM(L)EQ10AY1 LRM(L)EQ12AY1 LRM(L)EQ15AY1 LRM(L)EQ20AY1
3-26	Setting the freezing and refrigeration	○	●	○	○	●	○	●	Effective setting of Dip switches Freezing Refrigeration
3-39	Power supply voltage setting	○	○	●	●	○	○	○	200V 400V

d. Setting method with the AIRNET or type-III checker.

1) In case of the AIRNET
   • Use Setting Mode 2-6 (AIRNET address).
   • Use Setting Mode 2-16 (virtual indoor unit address).

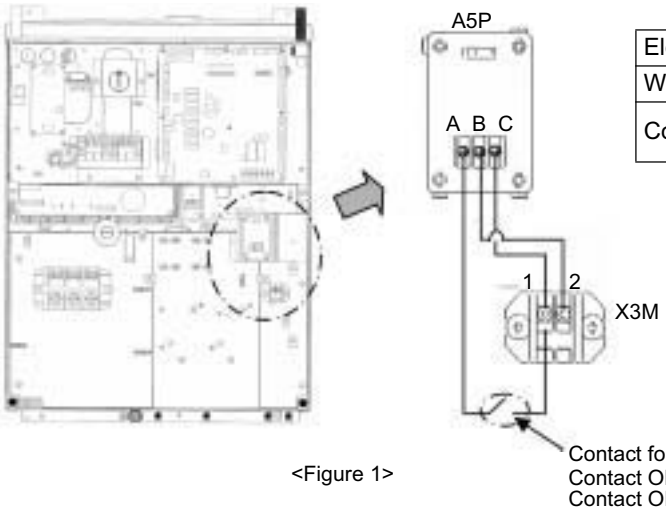
2) In case of a Type-III checker
   • Use Setting Mode 2-16 (virtual indoor unit address).

<table>
<tr><th rowspan="2">No.</th><th colspan="8">Display of setting items</th><th rowspan="2">Display of setting conditions</th></tr>
<tr><th>Setting item</th><th>H1P</th><th>H2P</th><th>H3P</th><th>H4P</th><th>H5P</th><th>H6P</th><th>H7P</th></tr>
<tr><td>6</td><td>AIRNET address</td><td>○</td><td>●</td><td>●</td><td>●</td><td>○</td><td>○</td><td>●</td><td>
<table>
<tr><th></th><th>H1P</th><th>H2P</th><th>H3P</th><th>H4P</th><th>H5P</th><th>H6P</th><th>H7P</th></tr>
<tr><td>(Factory set) 0</td><td>○</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr>
<tr><td>1</td><td>○</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>○</td></tr>
<tr><td colspan="8">~</td></tr>
<tr><td>63</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
</table>
Please give the address of 1 or more to when you do the AIRNET. Uses binary numbers for the address (six digits).</td></tr>
<tr><td>16</td><td>Virtual indoor unit address setting</td><td>○</td><td>●</td><td>○</td><td>●</td><td>●</td><td>●</td><td>●</td><td>
<table>
<tr><th></th><th>H1P</th><th>H2P</th><th>H3P</th><th>H4P</th><th>H5P</th><th>H6P</th><th>H7P</th></tr>
<tr><td>(Factory set) 0</td><td>○</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr>
<tr><td>1</td><td>○</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>○</td></tr>
<tr><td colspan="8">~</td></tr>
<tr><td>63</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
</table>
• When there is 1 outdoor unit, set the address to "1".
• When there are multiple outdoor units (outdoor-outdoor transmission connection), contact the After Sales Service Division.</td></tr>
</table>

3.1.1 Evaporation temperature correction at night-time, using an external contact

The two methods can be used to increase the evaporation temperature at night-time below:

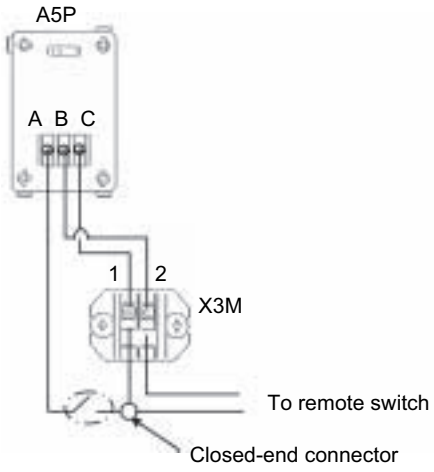
1. Receiving the time setting from the AIRNET (Setting Mode 2-8·9).
2. Using an external contact.
   The following describes the wiring needed to use an external contact.
   By a short-circuit between terminals A and C on the PCB (A5P) in the control box, the evaporation temperature can be corrected at night-time.
   For details about the wiring, refer to Figure 1. Protect the terminals using insulation sleeves or equivalent.



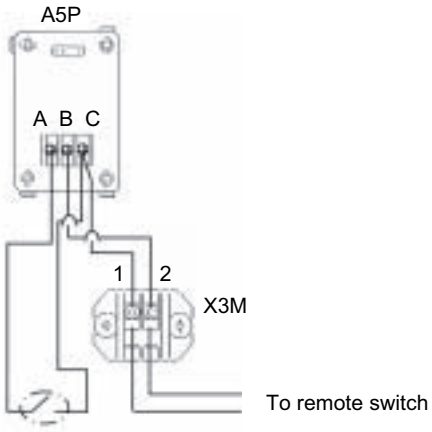
<Figure 1>

Electric wire thickness	0.75 - 1.25 mm^2
Wiring length	Max. 100 m
Contact rating	Minimum applied load 12 VDC, 1 mA or less

- When used in conjunction with a remote switch, connect the wire to the terminal using a ring connector (refer to Figure 2), or connect it to terminal C (refer to Figure 3). The terminal connectors must be protected with insulation sleeves.



<Figure 2>



<Figure 3>

By using the Setting Mode 2-8·9, you can change the amount of evaporation temperature shift that is allowed during the night-time evaporation temperature correction.
The shift amount is factory set to 1°C.
Moreover, the signal from the external contact will take precedence over the setting specified in Setting Mode 2-8·9.

4. Description of Functions and Operation

4.1 Operating Mode

[Classification of operating modes]

The table below lists all the operating modes available.

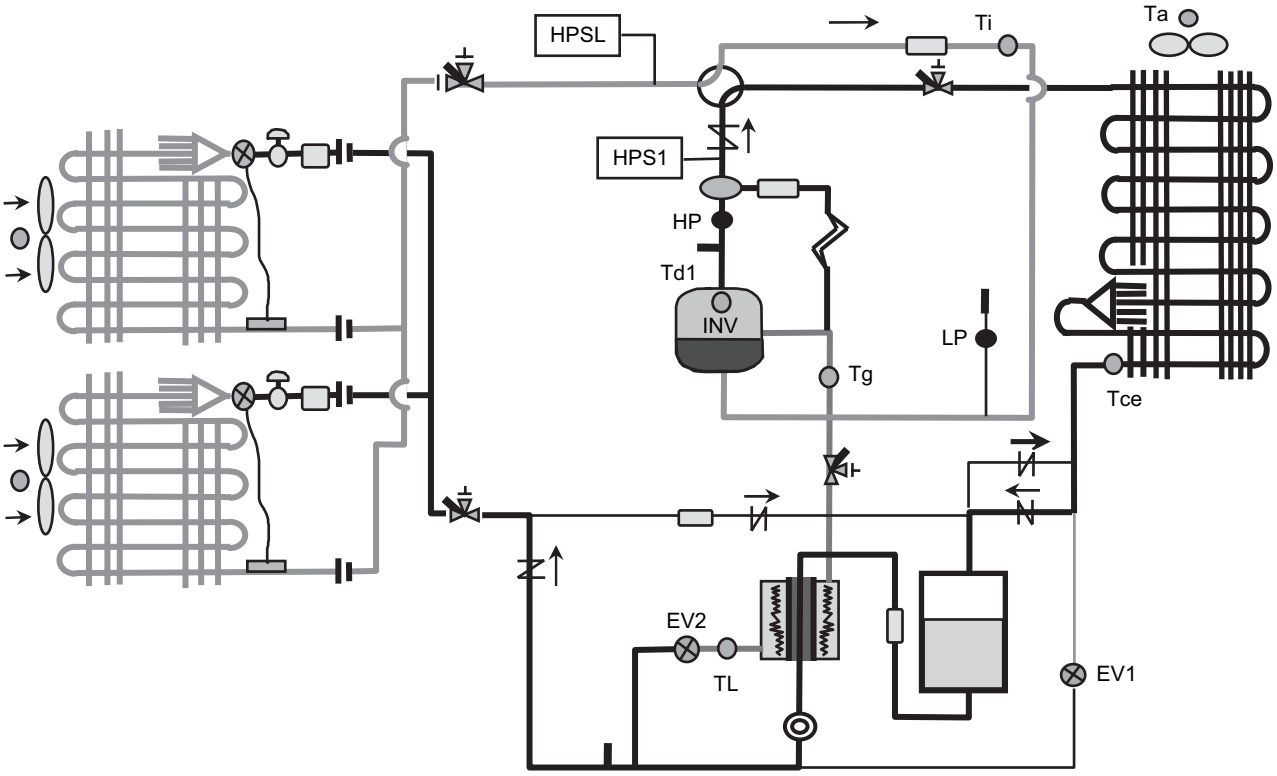
<List of operating modes>

Compressor	Cooling operation (Operating Mode)	(1 compressor)	(2 compressors)	(3 compressors)
INV	1	○	○	○
INV+STD1	2		○	○
INV+STD1+STD2	3			○
INV+STD2	4			○
STD1	5		○	○
STD1+STD2	6			○
STD2	7			○

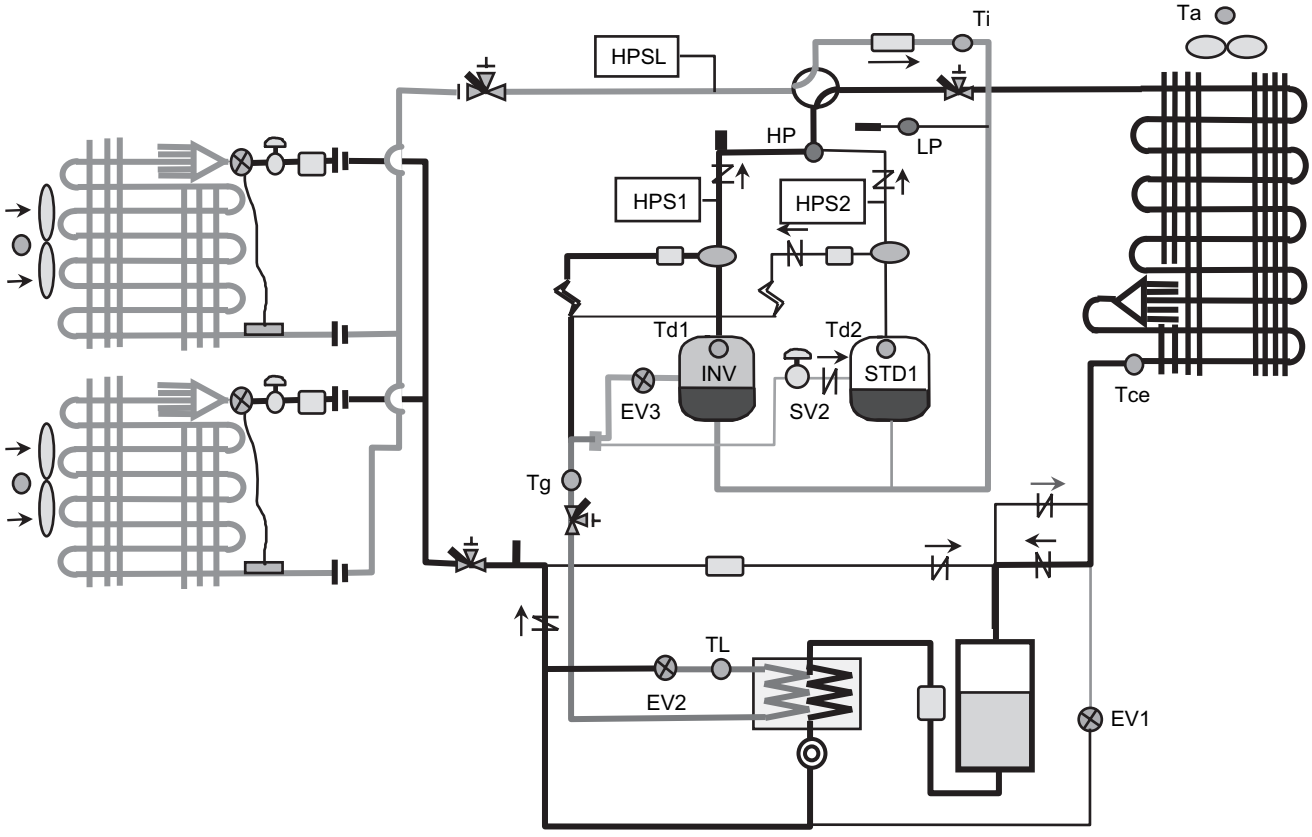
1 There are 8 operating modes available. (This includes a mode in which the system is stopped.)
2 Operating modes 5, 6 and 7 are INV compressor abnormal operation modes.
If operating mode is 4 or 7, the STD1 compressor may be defective.
If operating mode is 1, 2 or 5, the STD2 compressor may be defective.
3 The state in which all the compressors are stopped is operating mode 0.

1) Operation Mode 1

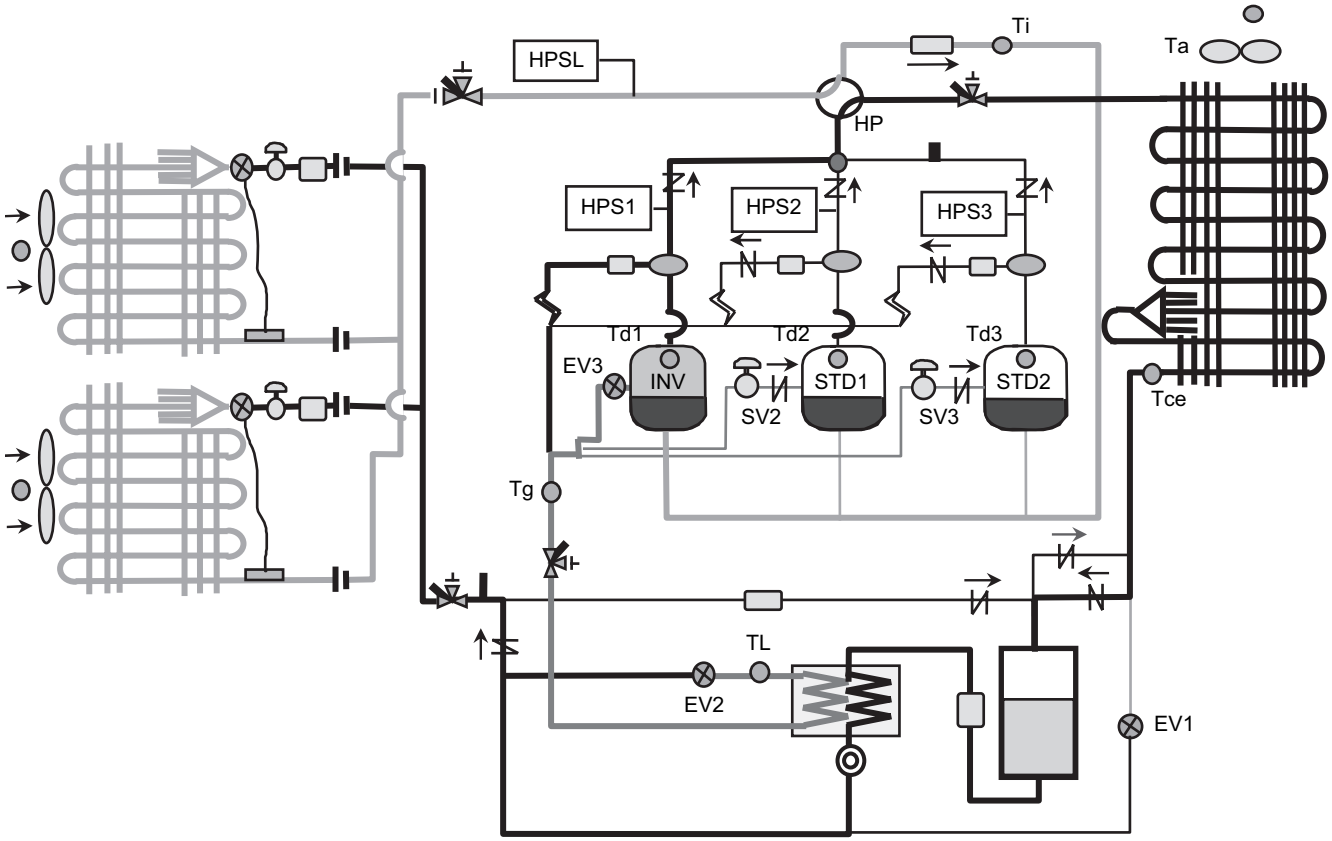
<In case of 1 compressor>



<In case of 2 compressors>

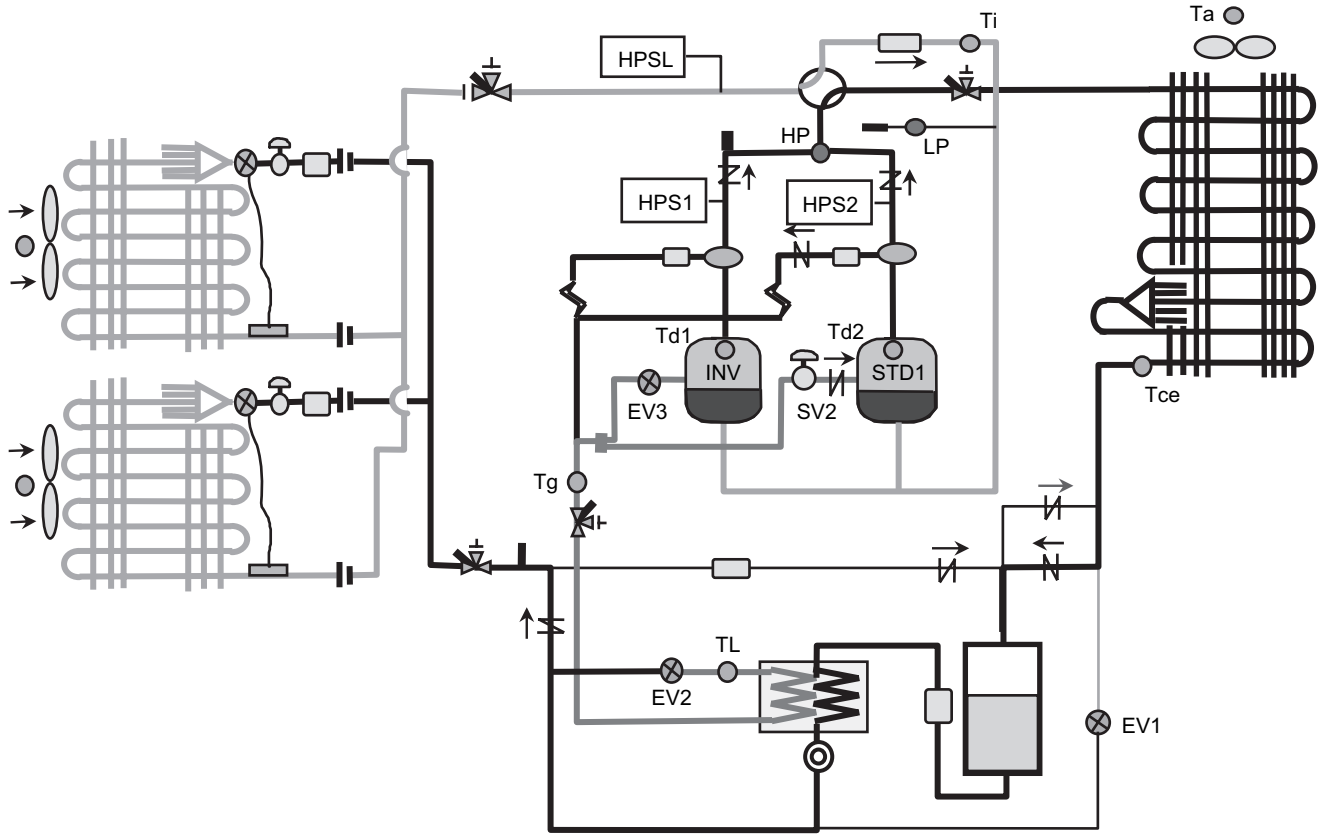


<In case of 3 compressors>

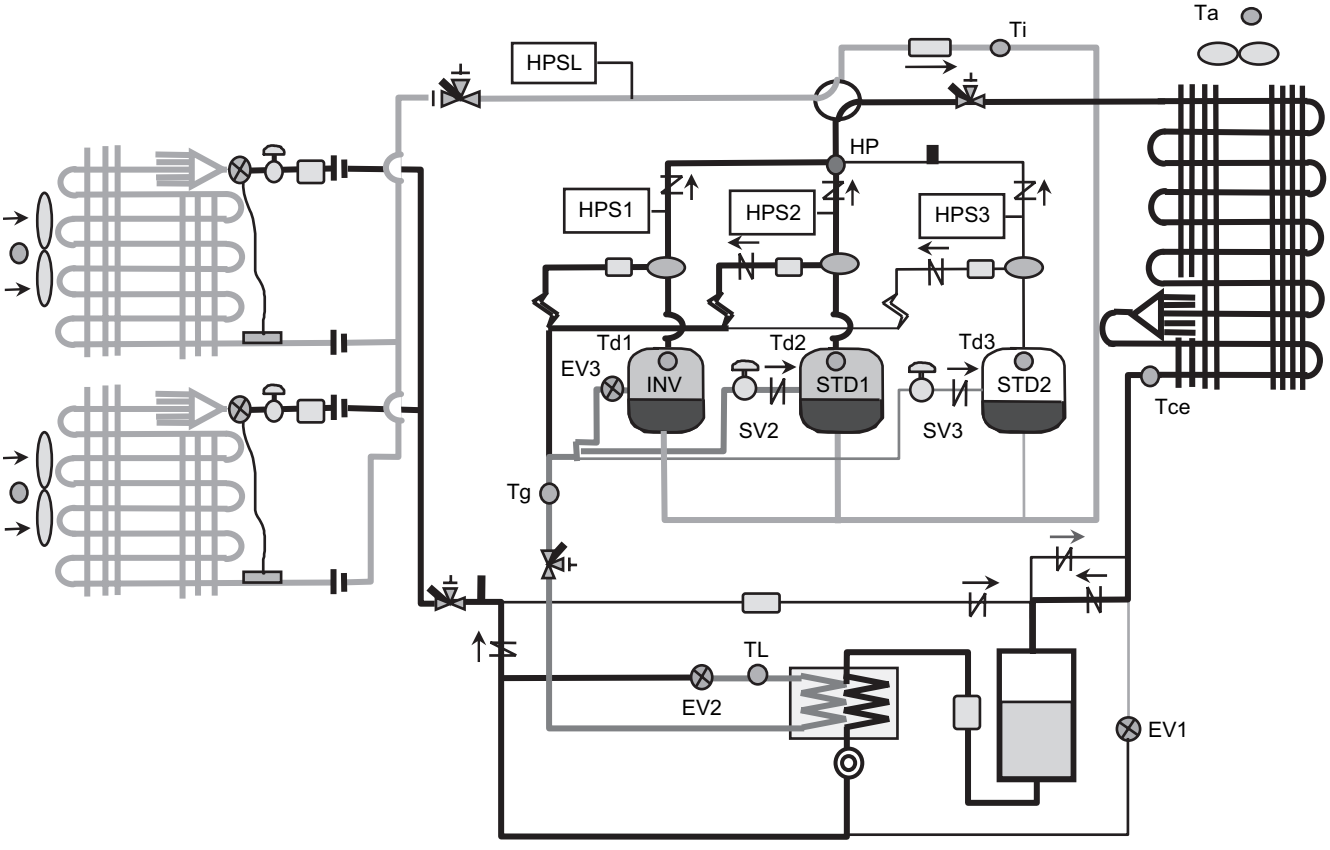


2) Operation Mode 2

<In case of 2 compressors>

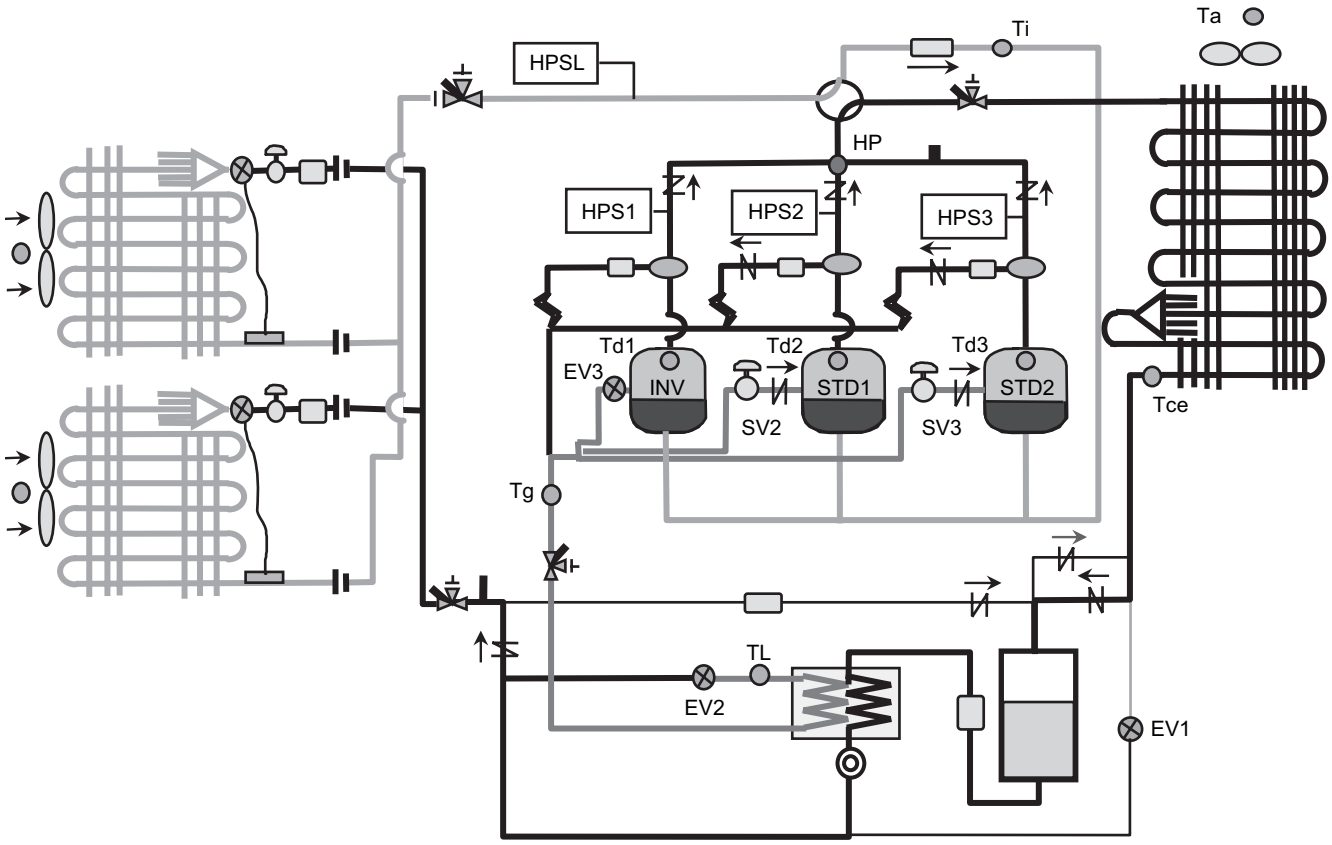


<In case of 3 compressors>



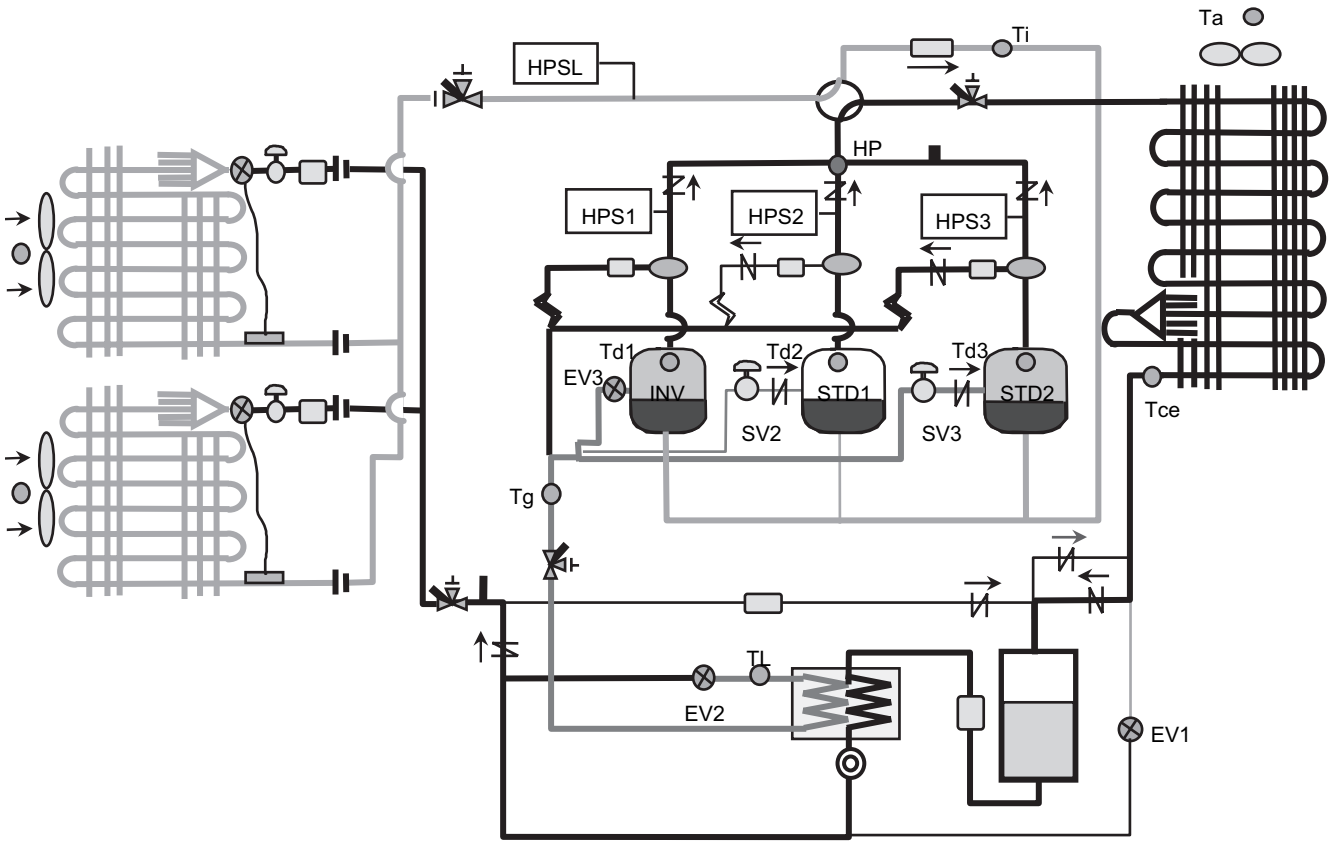
3) Operation Mode 3

<In case of 3 compressors>



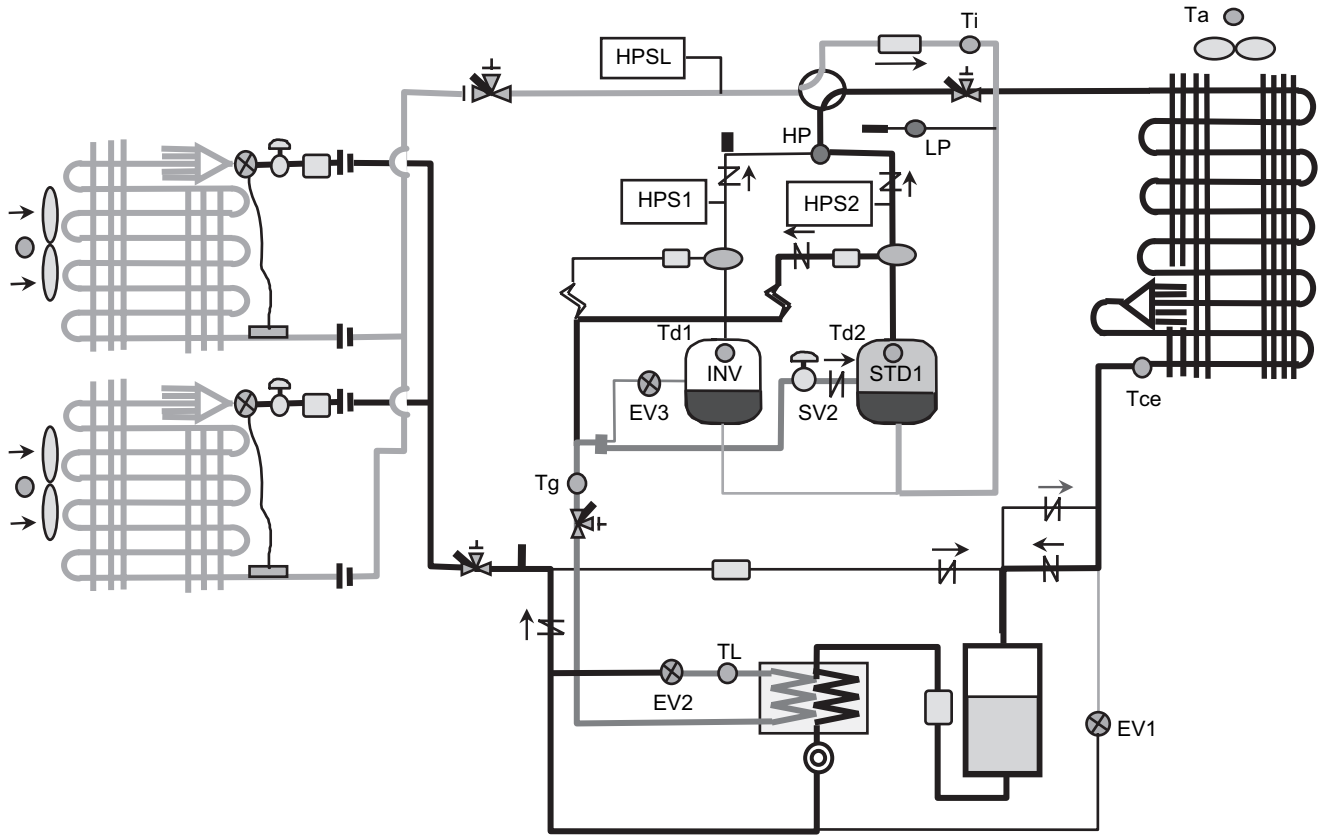
4) Operation Mode 4

<In case of 3 compressors>

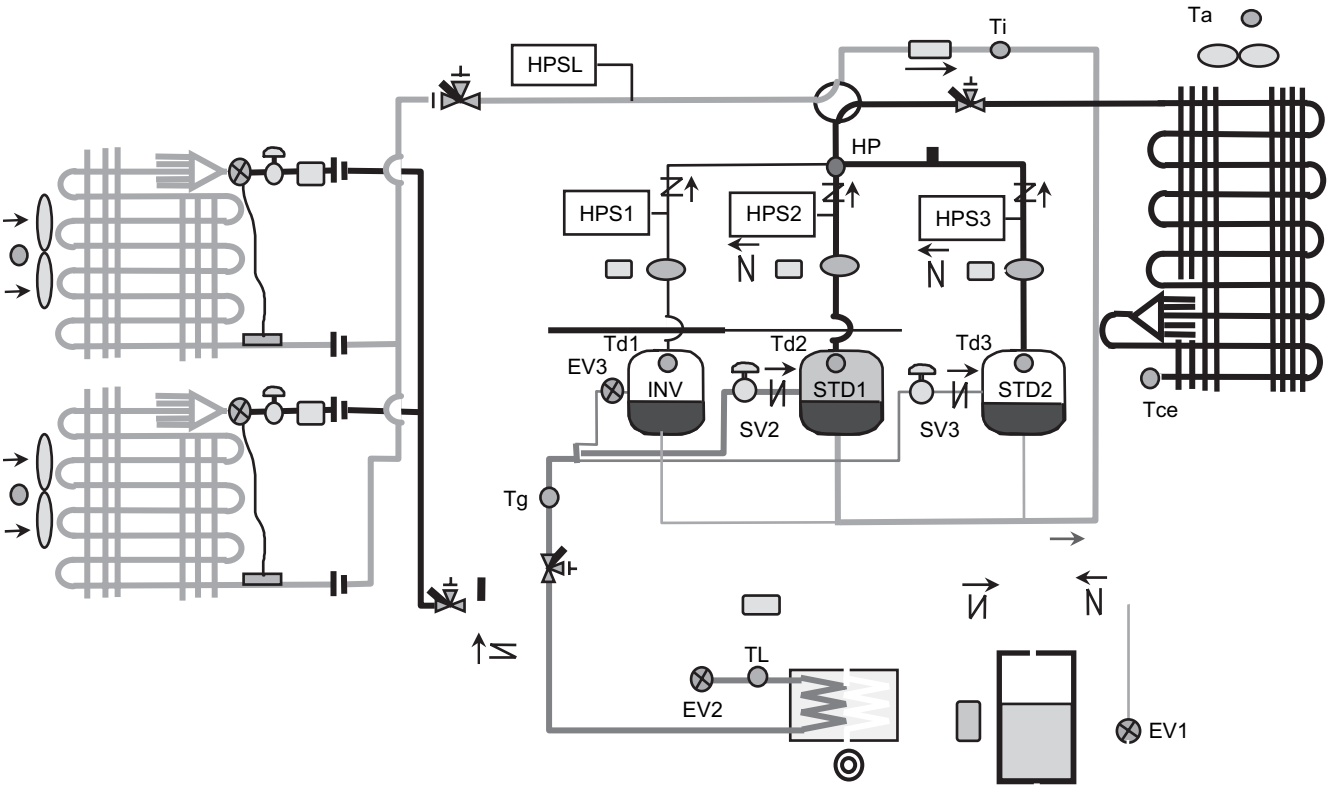


5) Operation Mode 5 (Defective of INV)

<In case of 2 compressors>

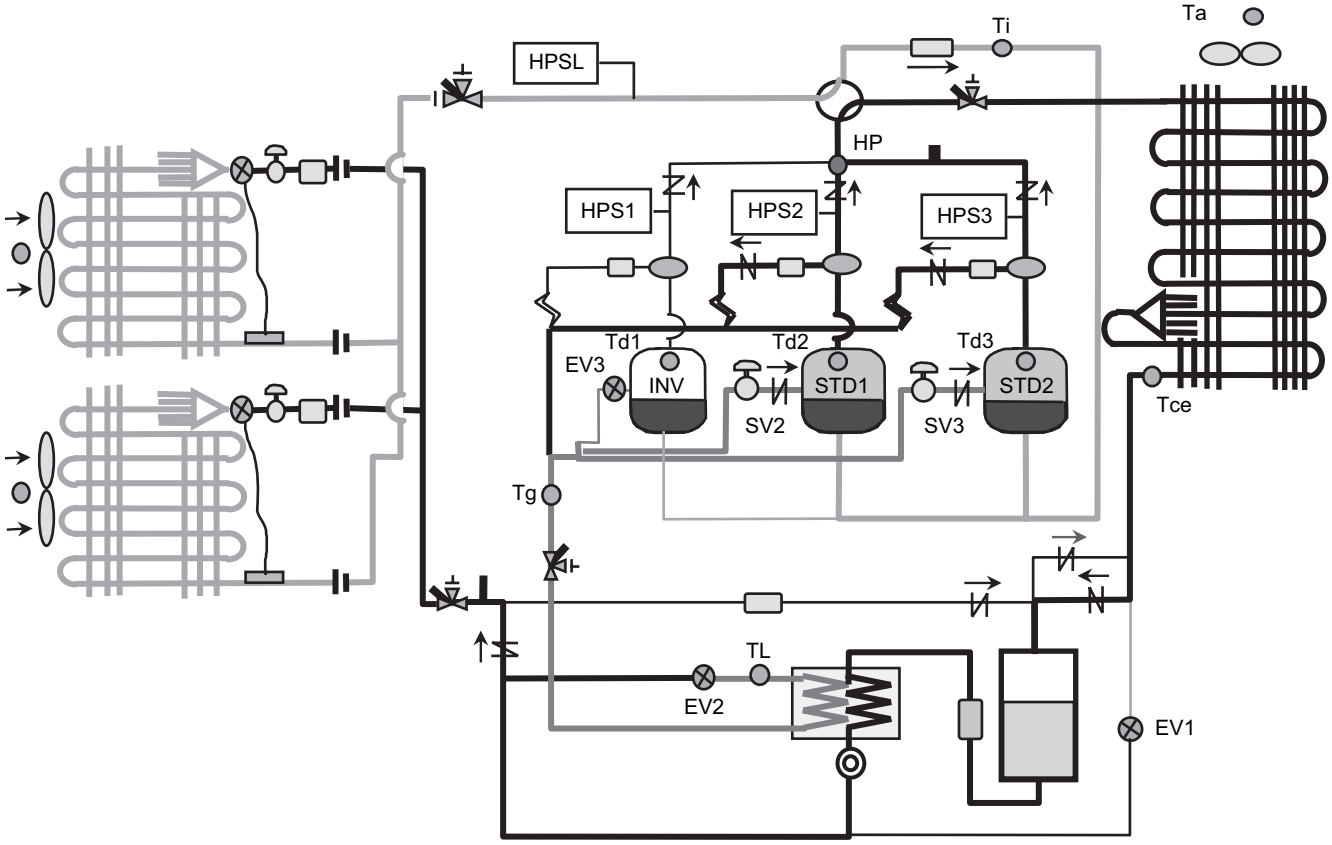


<In case of 3 compressors>



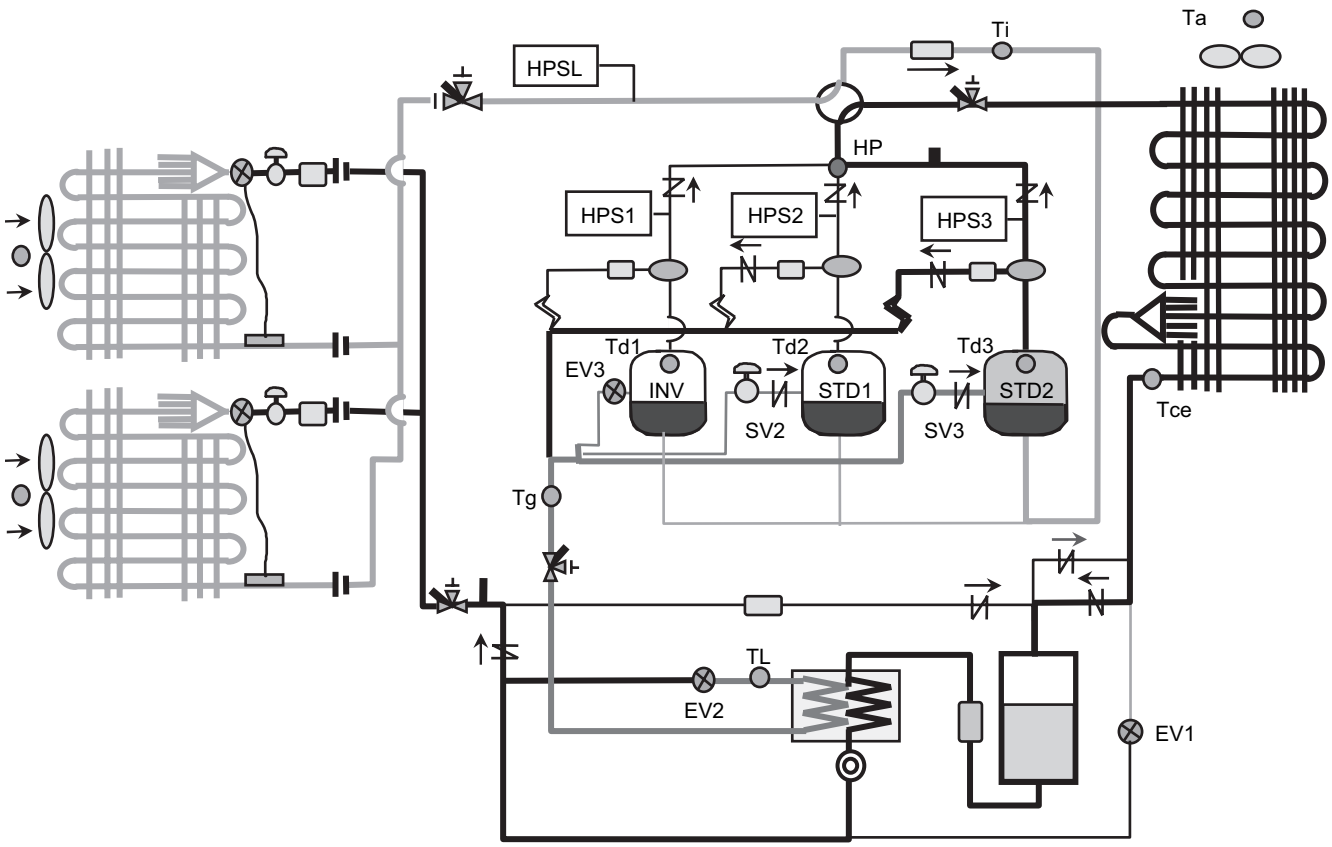
6) Operation Mode 6 (Defective of INV)

<In case of 3 compressors>

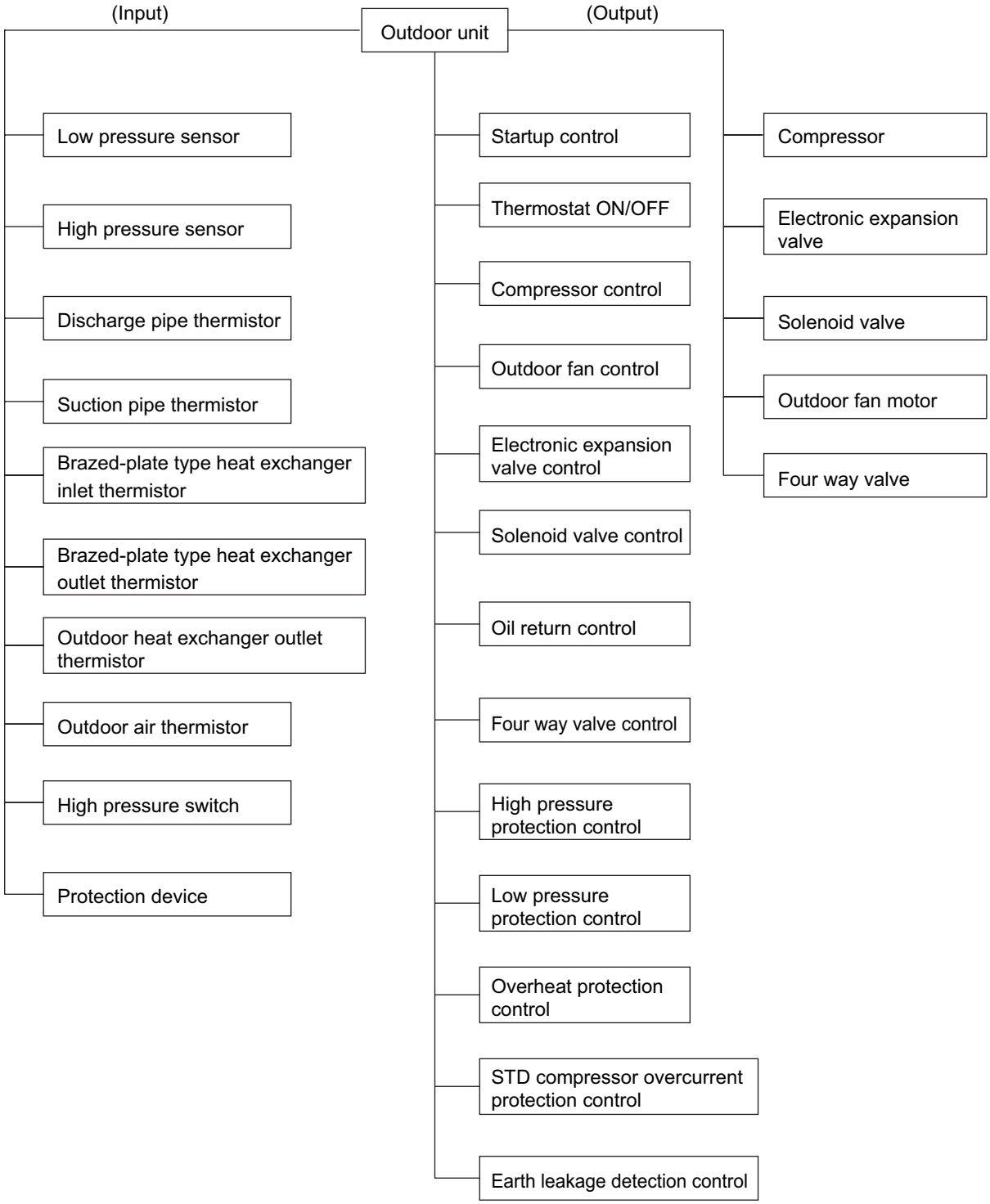


7) Operation Mode 7 (Defective of INV)

<In case of 3 compressors>



4.2 Outline of Functions



4.3 Detailed Description of Functions

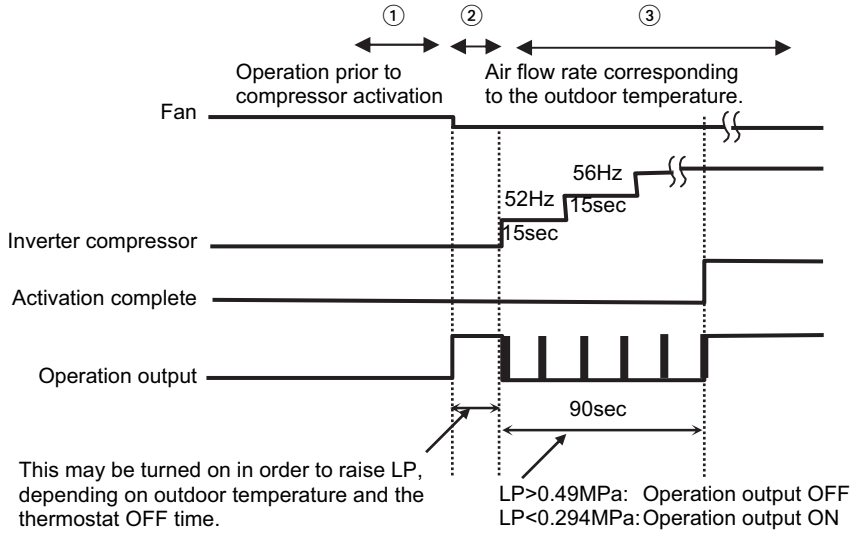
(1) Startup control

■ **The actuators will be operated in the following sequence when the thermostat is turned on:**

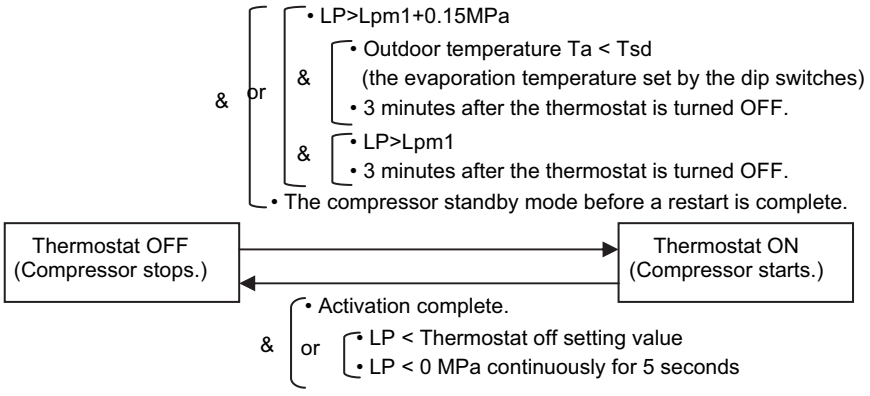
1 The outdoor fan will start to operate for 5 seconds. (This is intended to measure the outdoor temperature accurately.)

2 At power-up, the operation outputs (P1, P2) for low pressure conditions (see the chart on the right) will be turned on/off.
(This is intended to avoid possible liquid compression that is caused by the thermostatic expansion valve in the showcase being fully open during startup. To prevent liquid compression, the liquid solenoid valve will be cycled on and off until the thermostatic expansion valve catches up.)

3 The compressors will be activated.



(2) Thermostat ON/OFF



■ Thermostat off setting value

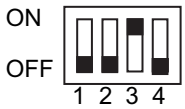
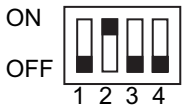
MT LRMEQ**	LT LRLEQ***
0.1MPa	-0.015MPa

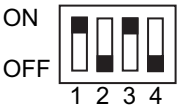
Lpm: Lpm1 obtained after an outdoor temperature correction is made.

Lpm1: Pressure equivalent to the evaporation temperature set by the dip switches (Tsd: Evaporation temperature set by the dip switches).

LP: The pressure detected by the low pressure sensor (S1NPL)

Conversion table for using the evaporation temperature (set by the dip switches) to determine its pressure equivalent

DS1	Tsd(Lpm1)	
	LRMEQ**	LRLEQ**
 Factory set	-10°C (0.47MPa)	-35°C (0.11MPa)
	-20°C (0.29MPa)	-45°C (0.03MPa)
	-15°C (0.37MPa)	-40°C (0.07MPa)
	-5°C (0.56MPa)	-30°C (0.16MPa)

DS1	Tsd(Lpm1)	
	LRMEQ**	LRLEQ**
	0°C (0.69MPa)	-25°C (0.22MPa)
	5°C (0.82MPa)	-20°C (0.29MPa)
	10°C (0.98MPa)	

(3) Compressor control

Compressor control

Normal capacity control

- Increase or decrease the compressor frequency using the low pressure as a controlled variable, in order to achieve the optimum cooling capacity for the target evaporation temperature (Tst). The target evaporation temperature value used will be the one set by the dip switches. (For details, see section 2, "Field Settings").
  The frequency value will be increased or decreased in steps of 1 every 30 seconds.
- If the low pressure (LP) drops below a pressure equivalent to the target evaporation temperature (Lpm) –0.015 MPa, the compressor speed will be reduced by one step (every 30 seconds).
- If the low pressure (LP) exceeds a pressure equivalent to the target evaporation temperature (Lpm) +0.015 MPa, the compressor speed will be increased by one step (every 30 seconds).

However, the thermostat ON/OFF operation will be performed if the load is low.

High compression ratio avoidance control

- If the compression ratio stays above 25 for 10 seconds or more, the compressor speed will be reduced. (This is intended to protect the compressor scrolls.)

Differential pressure inversion avoidance control

- If the high and low pressure differential is too small, the compressor speed will be increased according to the actual differential pressure. (This is intended to maintain lubrication.)

Oil return control by increasing the compressor frequency

- See the "Oil return control" section.

Control using a reduced LP

- Reduces the number of compressors being operated or the compressor speed, according to the actual low pressure and the speed at which the pressure is reduced.

- When stopping the STD compressor:
  & (
  - Operation mode is not 1, 5 or 7.
  - Low pressure (LP) < Rapidly dropping LP
- When reducing the INV compressor speed:
  & (
  - Operation mode = 1
  - Low pressure (LP) < LP required for shifting to minimum Hz

- Values for rapidly dropping LP and the LP required for shifting to minimum Hz

	LRMEQ**	LRLEQ**
Rapidly dropping LP	0.23MPa	0.02MPa
LP required for shifting to minimum Hz	0.20MPa	0.02MPa

Droop control using HP

- The compressor speed is lowered slightly according to the actual high pressure.
  High pressure (HP) > 3.23 MPa

Droop control using Td

- Reduces the compressor speed using the actual discharge thermistor temperature.
  The discharge pipe temperature (Td) ≥ 115°C for 1 minute or more.

Droop control using electrical current & INV

Current limit control

- Control will be performed according to the electrical current setting specified in Setting Mode 2-2, as the upper limit.
  Note that this setting will reduce the cooling capacity.
  (For details about setting procedures, see the "Setting Mode 2-2" section)

Droop control using INV compressor current

- Reduces the compressor speed using the inverter actual secondary current.
  Inverter secondary current setting for activating droop control: 14.7 A

Droop control using INV compressor fin temperature

- Reduces the compressor speed according to the actual inverter fin temperature.
  Inverter fin temperature setting for activating droop control: 84°C

STD compressor overcurrent protection control

- If any of the following conditions is met, the INV. compressor speed will be reduced.

  or (
  - The STD electrical current value>12.5 A and HP ≥ 3.28 MPa for 2 seconds.
  - The STD electrical current value>12 A and HP ≥ 3.28 MPa for 5 seconds.
- If any of the following conditions is met, the STD compressor will be stopped.
  - The STD current value>14.95 A for 2.1 seconds.
  - The STD current value>13 A for 5 seconds.
  - The STD current value>12.35 A for 20 seconds.

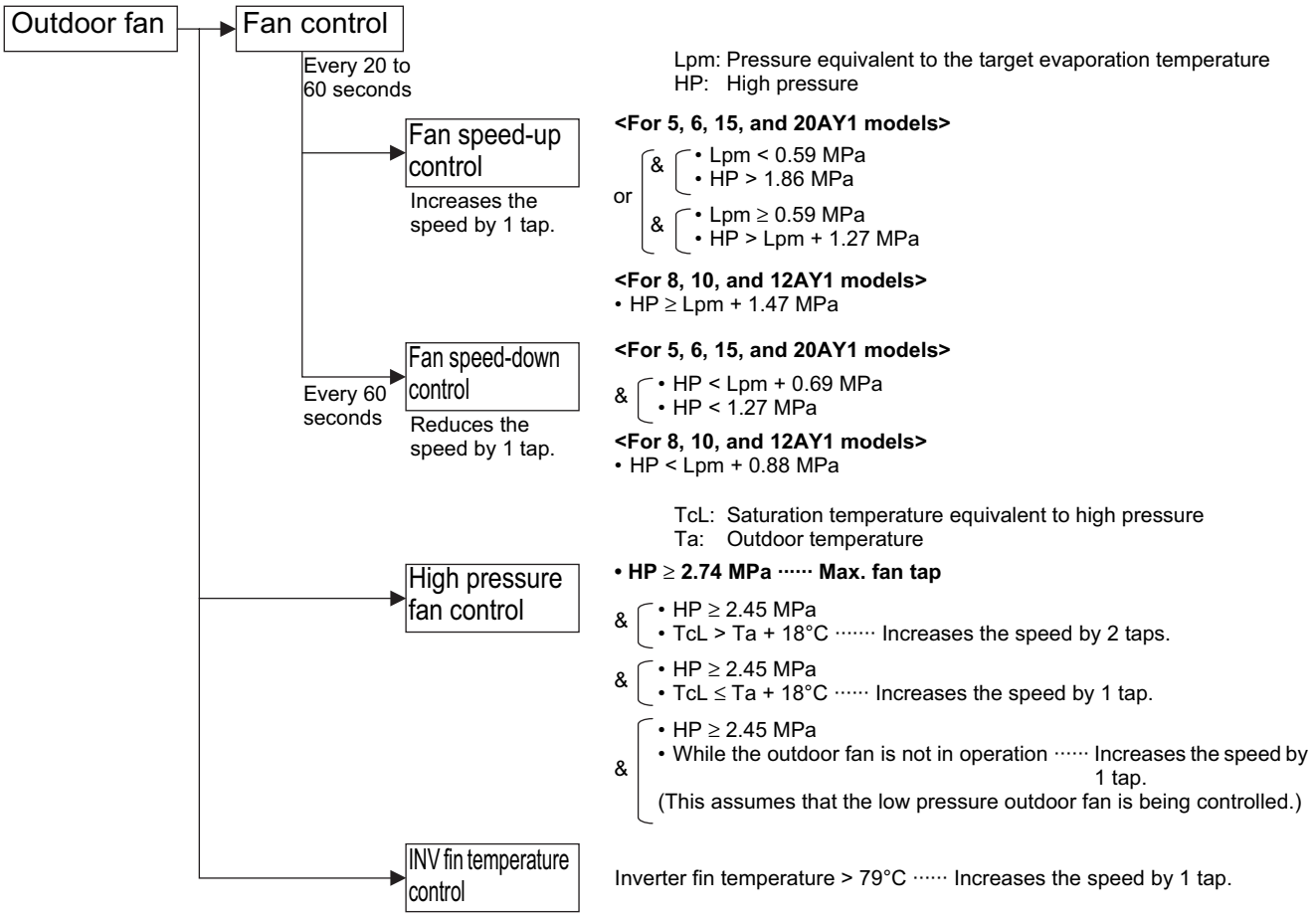
(3)-1. Compressor steps table

INV step	General step	INV compressor frequency (Hz)		INV step	General step	INV compressor frequency (Hz) + the number of STD compressors		INV step	General step	INV compressor frequency (Hz) + the number of STD compressors	
0	0	0		1	21	52+STD×1		1	41	52+STD×2	
1	1	52		2	22	56+STD×1		2	42	56+STD×2	
2	2	56		3	23	62+STD×1		3	43	62+STD×2	
3	3	62		4	24	68+STD×1		4	44	68+STD×2	
4	4	68		5	25	74+STD×1		5	45	74+STD×2	
5	5	74		6	26	80+STD×1		6	46	80+STD×2	
6	6	80		7	27	88+STD×1		7	47	88+STD×2	
7	7	88		8	28	96+STD×1		8	48	96+STD×2	
8	8	96	8,10,12, 15,20AY1	9	29	104+STD×1	(15,20AY1)	9	49	104+STD×2	
9	9	104		10	30	110+STD×1		10	50	110+STD×2	
10	10	110		11	31	116+STD×1		11	51	116+STD×2	
11	11	116		12	32	124+STD×1		12	52	124+STD×2	
12	12	124		13	33	132+STD×1	8AY1	13	53	132+STD×2	
13	13	132		14	34	144+STD×1		14	54	144+STD×2	
14	14	144		15	35	158+STD×1		15	55	158+STD×2	
15	15	158	5AY1	16	36	165+STD×1		16	56	165+STD×2	
16	16	165		17	37	176+STD×1		17	57	176+STD×2	
17	17	176		18	38	188+STD×1		18	58	188+STD×2	15AY1
18	18	188		19	39	202+STD×1	10AY1	19	59	202+STD×2	
19	19	202		20	40	210+STD×1		20	60	210+STD×2	
20	20	210		21	41	218+STD×1		21	61	218+STD×2	
21	21	218	6AY1	22	42	232+STD×1	12AY1	22	62	232+STD×2	20AY1

(4) Fan control

(4)-1. Outdoor fan control

The outdoor fan will be controlled using the high pressure as the controlled variable, as shown in the flow below.



(4)-2. Fan control before startup

The fan revolution will be set based on the outdoor temperature. This is intended to prevent the pressure from rising too rapidly and ensure the proper differential pressure.

Outdoor temperature	Ta<3°C	3°C≤Ta <9°C	9°C≤Ta <15°C	15°C≤Ta <21°C	21°C≤Ta <28°C	Ta≥28°C
LRM(L)EQ5AY1,6AY1	0	2	3	4	5	6
LRM(L)EQ8AY1,10AY1,12AY1	0	2	3	4	5	6
LRM(L)EQ15AY, 20AY1	0	2	3	4	5	6

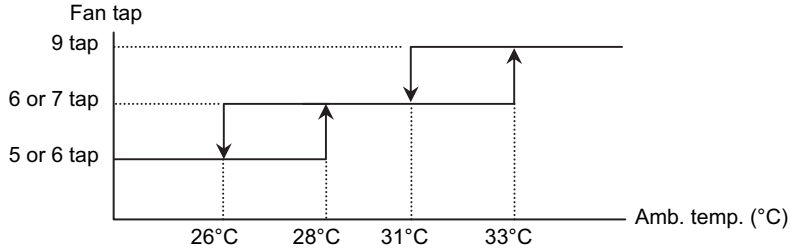
(4)-3. Outdoor fan residual operation

Reduces the high pressure to some degree when the thermostat is turned off. This will minimize the amount of sluggish refrigerant that is trapped due to high pressure when the system is stopped.

The fan will operate continuously for either 30 seconds after the compressors are turned off, or as long as the high pressure (HP) stays below 1.18 MPa.

(4)-4. Fan upper limit control based on the outdoor temperature

The fan upper speed will be limited based on the outdoor temperature. This will help reduce the operating sound.



(4)-5. Outdoor fan tap table

■ LRM(L)EQ5AY1

Fan (Fan tap)	0	1	2	3	4	5	6	7	8	9
Outdoor fan (standard mode) Revolution (rpm)	0	285	315	360	450	570	730	800	850	951

Fan (Fan tap)	0	1	2	3	4	5	6	7	8	9
Outdoor fan (high static pressure mode) Revolution (rpm)	0	285	315	360	450	570	730	850	1000	1020

■ LRM(L)EQ6AY1

Fan (Fan tap)	0	1	2	3	4	5	6	7	8	9
Outdoor fan (standard mode) Revolution (rpm)	0	285	315	360	450	570	800	951	1000	1020

Fan (Fan tap)	0	1	2	3	4	5	6	7	8
Outdoor fan (high static pressure mode) Revolution (rpm)	0	285	315	360	450	570	800	951	1020

■ LRM(L)EQ8AY1

Fan (Fan tap)	0	1	2	3	4	5	6	7	8	9
Outdoor fan (standard mode) Revolution (rpm)	0	350	370	400	460	530	630	680	710	760

Fan (Fan tap)	0	1	2	3	4	5	6	7	8	9
Outdoor fan (high static pressure mode) Revolution (rpm)	0	350	370	400	460	560	630	680	795	870

■ LRM(L)EQ10AY1

Fan (Fan tap)	0	1	2	3	4	5	6	7	8	9
Outdoor fan (standard mode) Revolution (rpm)	0	350	370	400	460	530	630	710	760	795

Fan (Fan tap)	0	1	2	3	4	5	6	7	8	9
Outdoor fan (high static pressure mode) Revolution (rpm)	0	350	370	400	460	560	630	760	821	870

■ LRM(L)EQ12AY1

Fan (Fan tap)	0	1	2	3	4	5	6	7	8	9
Outdoor fan (standard mode) Revolution (rpm)	0	350	370	400	460	560	680	795	821	850

Fan (Fan tap)	0	1	2	3	4	5	6	7	8
Outdoor fan (high static pressure mode) Revolution (rpm)	0	350	370	400	460	560	680	795	870

■ LRM(L)EQ15AY1

Fan (Fan tap)	0	1	2	3	4	5	6	7	8	9
Outdoor fan (standard mode) Revolution (rpm)	0	395	800	460	570	720	800	1050	1136	1186
	0	0	0	395	540	690	770	1020	1106	1156

Fan (Fan tap)	0	1	2	3	4	5	6	7	8
Outdoor fan (high static pressure mode) Revolution (rpm)	0	395	800	460	570	720	800	1136	1235
	0	0	0	395	540	690	770	1106	1205

■ LRM(L)EQ20AY1

Fan (Fan tap)	0	1	2	3	4	5	6	7	8	9
Outdoor fan (standard mode) Revolution (rpm)	0	395	800	460	570	800	930	1136	1186	1235
	0	0	0	395	540	770	900	1106	1156	1205

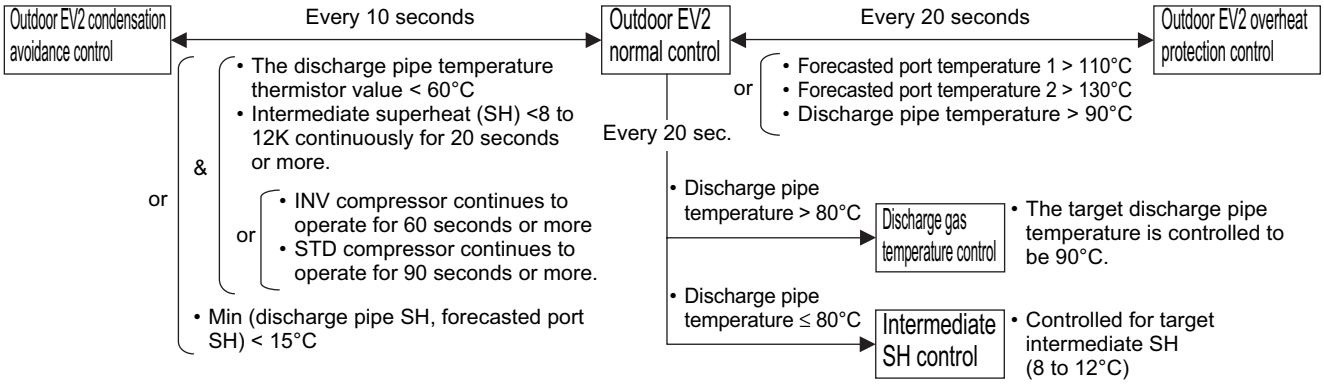
Fan (Fan tap)	0	1	2	3	4	5	6	7	8
Outdoor fan (high static pressure mode) Revolution (rpm)	0	395	800	460	570	800	930	1136	1235
	0	0	0	395	540	770	900	1106	1205

(5) Electrical expansion valve control

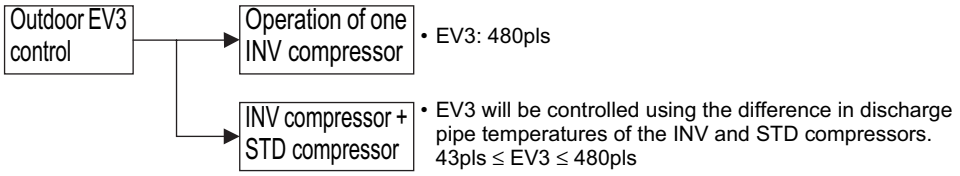
(5)-1. Outdoor electrical expansion valve (Y1E(EV1)) ····· This only applies to the Japanese domestic models. The valve will be activated when the reverse cycle defrost is used. For the LRM(L)EQ** models, a "0pls" command will be used all times.

(5)-2. Outdoor electrical expansion valve (Y2E(EV2)) ····· This valve will provide refrigerant gas injection flow rate control, overheating protection, and condensation protection.

- Initial valve opening: 43pls (mode 1), 55pls (modes other than mode 1)
- Control flow



(5)-3. Outdoor electronic expansion valve (Y3E(EV3)) ····· An electronic expansion valve is installed in the intermediate injection line of the INV compressor. The valve will operate in synch with the INV compressor, and allow the refrigeration oil to be returned to the INV compressor(s) that are in operation. It also creates an economizer circuit by means of gas injection. In addition, the valve will control the difference in discharge pipe temperatures between INV and STD compressors.

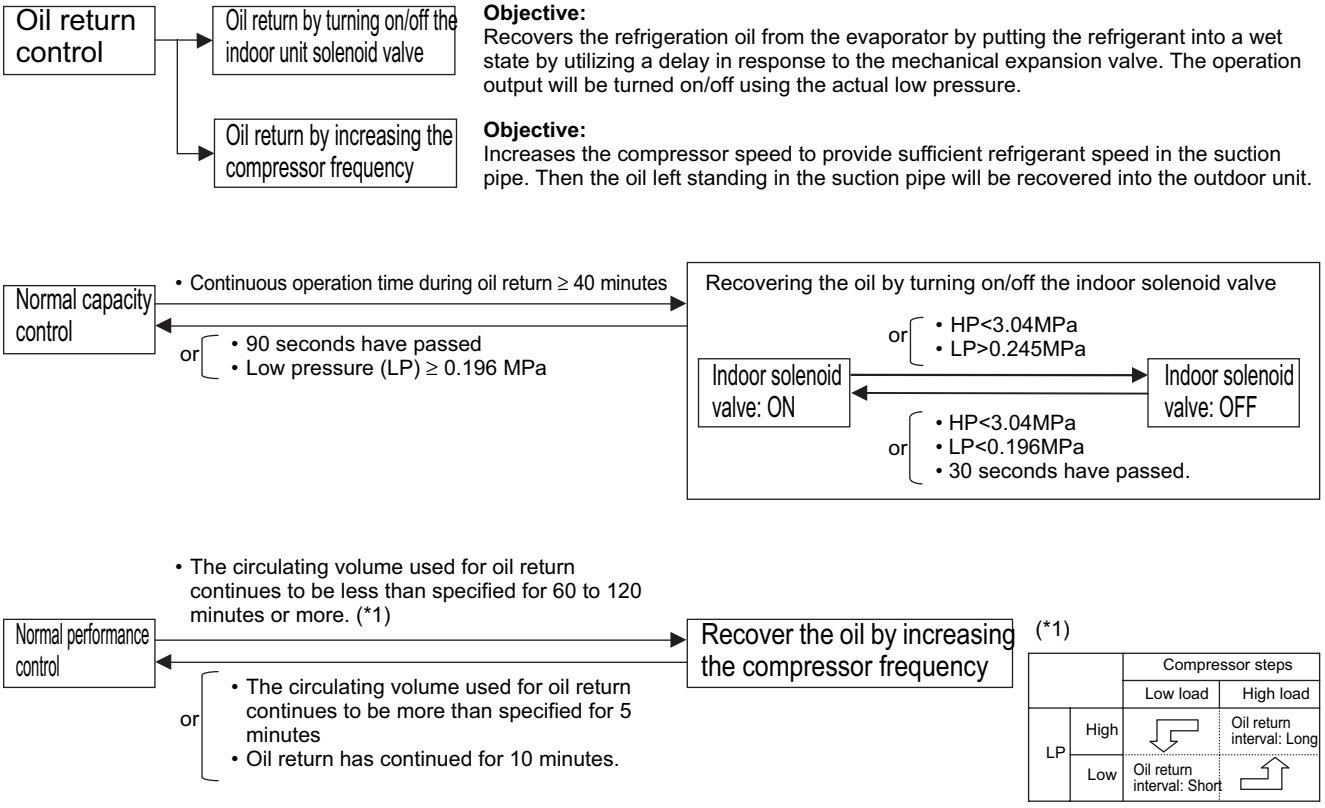


(6) Solenoid valve control

For 8, 10, 12, 15, and 20 AY1 models, a solenoid valve is installed in the intermediate injection line of the STD compressor. The valve will operate in synch with STD compressor, and allow the refrigeration oil to be returned to the STD compressor(s) that are in operation. Additionally, the valve will create a gas injection economizer circuit.

(7) Oil return control

Recover the refrigeration oil that has been left standing in the system at regular intervals.
Recover the oil into the outdoor unit, using a timer and low pressure.



(8) Four way valve control

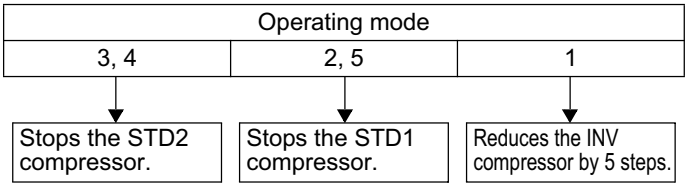
To standardize the hardware with the Japanese domestic models, the European models are also equipped with four-way valves.
The circulation volume has been factory set to insure that the four-way valve switches over properly. This allows the valve to be initialized to the proper position when the power is turned on.

- ON condition: The valve will be activated when the differential pressure at start-up is 0.294 MPa or less.
- OFF condition: The differential pressure stays above 0.49 MPa for 10 seconds, or the watchdog timer reaches 90 seconds.
  (Low, high pressure and discharge gas protection will take priority.)

For 5 and 6 AY1 models, the INV compressor steps will be increased. For the other models, the STD compressors will be operated.

(9) High pressure protection control

- If the following condition is met, the compressor load will be reduced significantly, as shown in the block diagram below.
  After multiple retries are made and the retry counter is reached, the compressor will stop and declare a problem (abnormal stop). (For details, see the list of errors.)
  The high-pressure retry code "E3" and the number of retries will be sent to the AIRNET.
  High pressure sensor>3.479 MPa.



- If the high pressure switch (operating pressure: 3.8 MPa) is activated (high pressure sensor reading ≥ 3.567 MPa), the compressor will stop and declare a problem (abnormal stop).
  To reset, turn off the power switch (or operation switch) and turn it back on again.

(10) Low pressure protection control

If the pressure drops below 0.00 MPa, the system will cease operation. After 2 to 10 minutes in standby, the system will resume operation. For a period of 3 hours after power-up, the system will continue to check whether the suction stop valve is closed. If the stop valve is seen to be closed, the system will stop and declare a problem (abnormal stop).
Three hours after the system was turned on, the system will no longer stop due to an abnormally low pressure.
(The low pressure retry code "E4" will be sent to the AIRNET.)

(11) Overheat protection control

- If any of the following conditions is met, the system will cease operation. INV compressors will resume operation after 2 to 6 minutes in standby, while STD compressors will restart after 3 to 10 minutes. If a particular compressor repeats this procedure 10 times, "F3" will be sent to the AIRNET; if it repeats it 15 times, the compressor will stop.
  For 5 and 6AY1 models, the compressors will stop and declare a problem (abnormal stop).
  For 8, 10, 12, 15, and 20AY1 models, the remaining compressors will perform a backup operation.

  or
  - The discharge gas temperature >120°C for 70 seconds.
  - The discharge gas temperature >125°C for 30 seconds.
  - The discharge gas temperature >130°C

- If the following condition is met, the relevant compressor will stop immediately and declare a problem (abnormal stop).
  The discharge gas temperature ≥150°C.

(12) STD compressor overcurrent protection control

- The following condition is met, the system will stop operation. STD compressors will resume operation after 30 minutes in standby. If a compressor repeats this procedure twice, "E0" will be sent to the AIRNET. If it repeats it three times, the relevant compressor will stop.
  The STD compressor current >14.95A for 2.1 seconds or more.

(13) Earth leakage detection control

1. Detection using a earth leakage detection board
   If the high-pressure sensor reading exceeds 3.567 MPa, the earth leakage detector PCB will be activated. Then the compressor operation will stop and declare a problem (abnormal stop).
   To reset, turn off the power switch (or operation switch) and turn it back on again.
2. Detection during initial power-up
   The system will check for earth leakage while the compressor is running for the first 10 seconds after power-up. A compressor will stop abnormally if the power breaker is turned off or the earth leakage detector PCB is activated during the 10-second period describe above. If the breaker is turned off, turn the breaker on again. If the same thing happens again, disable the defective compressor and perform a backup operation using the remaining compressors.
   With the operation switch in OFF, reset the system by turning on the power off and then back on again.

5. Test Operation

5.1 Refrigerant Piping

[REFRIGERANT]
This System use R410A refrigerant.

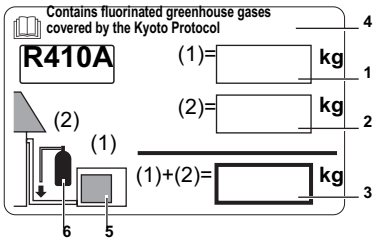
Caution This unit is already filled with a certain amount of R410A.
Never open liquid and gas shutoff valve until the step Specified in "**5.4. CHECKS AFTER WORK COMPLETION**".

- The refrigerant R410A requires strict cautions for keeping the system clean, dry and tight. Read this chapter carefully and follow these procedures correctly.
  A.Clean and dry
  Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting mixed into the system.
  B.Tight
  Take care to keep the system tight when installing.
  R410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth's protection against harmful ultraviolet radiation.
  R410A can contribute slightly to the greenhouse effect if it is released.
- Since R410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition changes and the system will not work properly.
- Be sure to perform refrigerant replenishment. Refer to "**5.4 CHECKS AFTER WORK COMPLETION**" and the label of instructions on refrigerant replenishment on the cover surface of the control box,

[Important information regarding the refrigerant used]
This product contains fluorinated greenhouse gases covered by the Kyoto Protocol. Do not vent gases into the atmosphere.
Refrigerant type : R410A
GWP(1) value : 2090
(1)GWP = global warming potential
Please fill in with indelible ink,

- ① the factory refrigerant charge of the product,
- ② the additional refrigerant amount charged in the field and
- ① + ② the total refrigerant charge

on the refrigerant charge label supplied with the product.
The filled out label must be adhered in the proximity of the product charging port (e.g. onto the inside of the service cover).



1 factory refrigerant charge of the product : see unit name plate
2 additional refrigerant amount charged in the field
3 total refrigerant charge
4 Contains fluorinated greenhouse gases covered by the Kyoto Protocol
5 outdoor unit
6 refrigerant cylinder and manifold for charging

[DESIGN PRESSURE]
Since design pressure is 3.8MPa or 38bar (for R407C units : 3.3MPa or 33bar), the wall thickness of pipes should be more carefully selected in accordance with the relevant local and national regulations.

5.1.1 To Piping Work Contractors

- Never open the shutoff valve until the steps specified in "**5.2 FIELD WIRING**" and "**5.3.3 Checking of device and installation conditions**" of piping.
- Do not use flux at the time of brazing and connecting refrigerant pipes. Use phosphorous copper brazing filler metal (BCuP-2), which does not require flux. Chlorine-based flux causes piping corrosion. Furthermore, if fluoride is contained, the flux will have adverse influences on the refrigerant piping line, such as the deterioration of refrigerating machine oil.

Caution

- All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.

[Precautions for reuse of existing refrigerant piping / heat exchangers]

Keep the following points in mind for the reuse of existing refrigerant piping / heat exchangers.
A malfunction may result if there is deficiency.

- Do not use the existing piping in the following cases. Perform new piping instead.
  - The piping is different in size.
  - The strength of the piping is insufficient.
  - The compressor of the condensing unit previously used caused a malfunction.
    An adverse influence of residual substances, such as the oxidation of refrigerant oil and the generation of scale, is considered.
  - If the indoor unit or outdoor unit is disconnected from the piping for a long time.
    The intrusion of water and dust into the piping is considered.
  - The copper pipe is corroded.
  - The refrigerant of the condensing unit previously used was other than R410A (e.g., R404A / R507 or R407C).
    The contamination of the refrigerant with heterogeneity is considered.
- If there are welded connections midway on the local piping, make gas leakage checks on the welded connections.
- Be sure to insulate the connection piping.
  The liquid and gas pipe temperatures are as follows:
  Liquid pipe arrival minimum temperature: 0°C
  Gas pipe arrival minimum temperature:
  –26°C (Refrigeration Series)
  –46°C (Freezer Series)
  In the case of thickness insufficiency, add additional insulation material or renew the existing insulation material.
- Renew the insulation material if the insulation material is degraded.

Keep the following points in mind for the reuse of existing heat exchangers

- Units with insufficient design pressure (since this product is an R410A unit) require a lower-stage design pressure of 2.5 MPa [25 bars].
- Units for which the path to the heat exchanger has been routed so that the flow of refrigerant is from bottom to top
- Units with copper tubing or fan corrosion
- Units that may be contaminated with foreign matter such as rubbish or other dirt

5.1.2 Selection of Piping Material

- Make sure that the inner side and outer side of the piping used is clean and free of contaminants, such as sulphur, oxide, dust, chips, oil and fat, and water.
  It is desirable that the maximum oil adhesion in the piping is 30 mg per 10 m.
- Use the following type of refrigerant piping.
  Material: Seamless phosphorus deoxidized copper tube (C1220T-O for a maximum outer diameter of 15.9 mm and C1220T-1/2H for a minimum outer diameter of 19.1 mm)

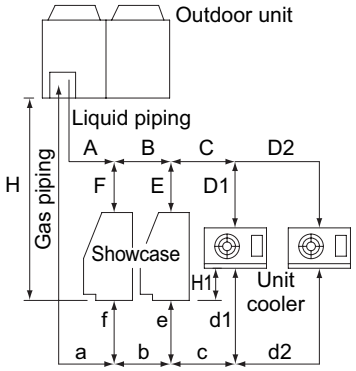
Refrigerant piping size and wall thickness: Decide the size and thickness from the following table.
(This product uses R410A. The withstand pressure of O type may be insufficient if it is used for piping with a minimum diameter of 19.1 mm. Therefore, be sure to use 1/2 H type with a minimum thickness of 1.0 mm.
If O type is used for piping with a minimum diameter of 19.1 mm, a minimum thickness of 1.2 mm will be required. In that case, be sure to perform the blazing of each joint.)

- Be sure to perform piping work within the range specified in the following table.

〈Refrigerant piping length〉

Max. permissible one-way piping length (equivalent length)	LRMEQ5~20AY1	a + b + c + d ≤ 130m (d is d1 or d2 or e, f whichever is longer)
	LRLEQ5~20AY1	a + b + c + d ≤ 70m (d is d1 or d2 whichever is longer)
Max. branch piping length (actual length)		b + c + d ≤ 30m (d is d1 or d2 whichever is longer)
Max. difference in height between indoor and outdoor units	unit below outdoor unit	H ≤ 35m (Note)
	unit above outdoor unit	H ≤ 10m
Difference in height between indoor units		H1 ≤ 5m

Note: A trap is required at 5 m intervals from outdoor unit.



〈Refrigerant piping size〉

(MT (Medium Temperature)) LRMEQ5~20AY1 (Unit : mm)

Outdoor unit side	Piping size			
	Liquid pipe		Gas pipe	
	50m or less	50~130m	50m or less	50~130m
5A · 6A type	ϕ9.5 × 0.8 (O type)	ϕ12.7 × 0.8 (O type)	ϕ19.1 × 1.0 (1/2H type)	ϕ22.2 × 1.0 (1/2H type)
8A · 10A · 12A type	ϕ9.5 × 0.8 (O type)	ϕ12.7 × 0.8 (O type)	ϕ25.4 × 1.0 (1/2H type)	ϕ28.6 × 1.0 (1/2H type)
15A · 20A type	ϕ12.7 × 0.8 (O type)	ϕ15.9 × 1.0 (O type)	ϕ31.8 × 1.1 (1/2H type)	ϕ34.9 × 1.1 (1/2H type)
Piping between branching areas (B, b, C, c)	Select the piping from the following table in accordance with the total capacity of indoor units connected downstream.			

Total capacity of indoor units after branching	Gas pipe size	Liquid pipe size
Less than 6.0 kW	ϕ12.7 × 0.8 (O type)	ϕ6.4 × 0.8 (O type)
6.0 kW or over and less than 9.9 kW	ϕ15.9 × 1.0 (O type)	ϕ9.5 × 0.8 (O type)
9.9 kW or over and less than 14.5 kW	ϕ19.1 × 1.0 (1/2H type)	
14.5 kW or over and less than 18.5 kW	ϕ22.2 × 1.0 (1/2H type)	
18.5 kW or over and less than 25.0 kW	ϕ25.4 × 1.0 (1/2H type)	
25.0 kW or over and less than 31.0 kW	ϕ28.6 × 1.0 (1/2H type)	ϕ12.7 × 0.8 (O type)
31.0 kW or over	ϕ31.8 × 1.1 (1/2H type)	

No size after branching can exceed the size of any upstream piping.

Piping between branching areas and each unit	Adjust the size of the piping so that it will coincide with the size of piping connecting to the indoor unit.

(LT (Low Temperature)) LRLEQ5~20AY1 (Unit : mm)

Outdoor unit side	Piping size			
	Liquid pipe		Gas pipe	
	50m or less	50~70m	25m or less	25~70mm
5A · 6A type	ϕ9.5 × 0.8 (O type)	ϕ12.7 × 0.8 (O type)	ϕ19.1 × 1.0 (1/2H type)	ϕ22.2 × 1.0 (1/2H type)
8A · 10A · 12A type	ϕ9.5 × 0.8 (O type)	ϕ12.7 × 0.8 (O type)	ϕ25.4 × 1.0 (1/2H type)	ϕ28.6 × 1.0 (1/2H type)
15A · 20A type	ϕ12.7 × 0.8 (O type)	ϕ15.9 × 1.0 (O type)	ϕ31.8 × 1.1 (1/2H type)	ϕ34.9 × 1.1 (1/2H type)
Piping between branching areas (B, b, C, c)	Select the piping from the following table in accordance with the total capacity of indoor units connected downstream.			

Total capacity of indoor units after branching	Gas pipe size	Liquid pipe size
Less than 2.3 kW	ϕ12.7 × 0.8 (O type)	ϕ6.4 × 0.8 (O type)
2.3 kW or over and less than 4.4 kW	ϕ15.9 × 1.0 (O type)	ϕ9.5 × 0.8 (O type)
4.4 kW or over and less than 6.4 kW	ϕ19.1 × 1.0 (1/2H type)	
6.4 kW or over and less than 7.8 kW	ϕ22.2 × 1.0 (1/2H type)	
7.8 kW or over and less than 10.8 kW	ϕ25.4 × 1.0 (1/2H type)	
10.8 kW or over and less than 13.4 kW	ϕ28.6 × 1.0 (1/2H type)	ϕ12.7 × 0.8 (O type)
13.4 kW or over	ϕ31.8 × 1.1 (1/2H type)	

No size after branching can exceed the size of any upstream piping.

Piping between branching areas and each unit	Adjust the size of the piping so that it will coincide with the size of piping connecting to the indoor unit.

5.1.3 Drier Installation

Caution This product requires that a drier be installed on liquid piping on site.
(Operating the unit without a drier installed may result in equipment failure.)

Select a drier from the following chart:

Model	Required dryer core (recommended type)
LRMEQ5AY1, LRLEQ5AY1 LRMEQ6AY1, LRLEQ6AY1	80g (100% molecular sieve equivalent) (DML083/DML083S : Danfoss made)
LRMEQ8AY1, LRLEQ8AY1 LRMEQ10AY1, LRLEQ10AY1 LRMEQ12AY1, LRLEQ12AY1	160g (100% molecular sieve equivalent) (DML163/DML163S : Danfoss made)
LRMEQ15AY1, LRLEQ15AY1 LRMEQ20AY1, LRLEQ20AY1	160g (100% molecular sieve equivalent) (DML164/DML164S : Danfoss made)

- Install the drier in a horizontal orientation wherever possible.
- Install the drier as close to the outdoor unit as possible.
- Remove the drier cap immediately before brazing (to prevent absorption of airborne moisture).
- Follow instructions in the drier instruction manual concerning drier brazing.
- Repair any burning of drier paint that occurs during drier brazing. Contact the manufacturer for more information about paint for repair use.
- Flow direction is specified for some type of the dryer.
  Set the flow direction according to the operation manual of the dryer.

5.1.4 Operation Method of Shutoff Valves

Follow the instructions below when operating each shutoff valve.

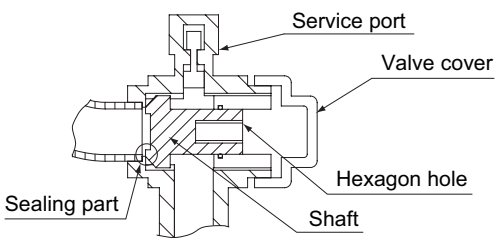
Caution

- Do not open the shutoff valve until the steps specified in "**5.3.3 Checking of device and installation conditions**" is completed.
  Do not leave the shutoff valve opened without turning the power on, otherwise refrigerant may be condensed in the compressor and the insulation of the main power supply circuit may be degraded.
- Be sure to use an exclusive tool to handle the shutoff valve. The shutoff valve is not of back sheet type. Excessive force imposed may break the valve.
- Use a charge hose when using the service port.
- Make sure that there is no refrigerant gas leakage after the valve cover and cap are securely tightened.

〈**Tightening torque**〉
Check with the following table the sizes of shutoff valves incorporated by each model and the tightening torque values of the respective shutoff valves.

Shutoff valve sizes

	5A type	6A type	8A type	10A type	12A type	15A type	20A type
Liquid side shutoff valve	ϕ9.5					ϕ12.7	
Gas side shutoff valve	ϕ19.1		ϕ25.4			ϕ31.8	

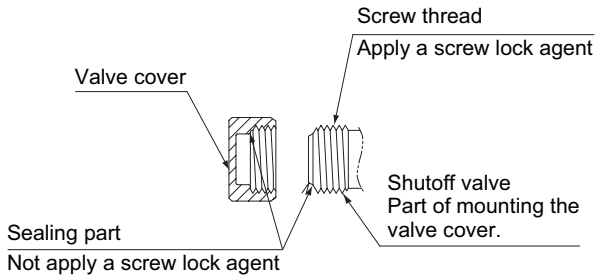


Shutoff valve sizes	Tightening torque N•m (closes clockwise)			
	Shaft (valve body)		Valve cover	Service port
ϕ9.5	5.4~6.5	Hexagon wrench: 4mm	13.5~16.5	11.5~13.9
ϕ12.7	8.1~9.9		18.0~22.0	
ϕ19.1	27.0~33.0	Hexagon wrench: 8mm	22.5~27.5	
ϕ25.4				
ϕ31.8	26.5~29.4	Hexagon wrench: 10mm	44.1~53.9	

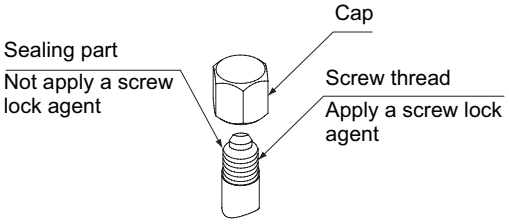
〈**Opening method**〉
1. Remove the valve cover and turn the shaft anticlockwise with a hexagon wrench.
2. Turn the shaft until the shaft stops.
3. Tighten the valve cover securely. Refer to the above table for the tightening torque according to the size.

〈**Closing method**〉
1. Remove the valve cover and turn the shaft clockwise with a hexagon wrench.
2. Tighten the shaft until the shaft comes in contact with the sealing part of the valve.
3. Tighten the valve cover securely. Refer to the above table for the tightening torque according to the size.

〈**Handling Precautions for Valve Cover**〉
- Be careful not to damage the sealing part.
- At the time of mounting the valve cover, apply a screw lock agent to the screw thread.
- Do not apply a screw lock agent (for flare nut use) to the sealing part.
- Be sure to tighten the valve cover securely after operating the valve. Refer to "**Operation Method of Shutoff Valves**" for the tightening torque of the valve.



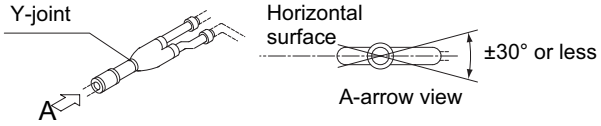
〈**Handling Precautions for Service Port**〉
- Work on the service port with a charge hose provided with a pushing rod.
- At the time of mounting the cap, apply a screw lock agent to the screw thread.
- Do not apply a screw lock agent (for flare nut use) to the sealing part.
- Be sure to tighten the cap securely after the work. Refer to "**Operation Method of Shutoff Valves**" for the tightening torque of the cap.



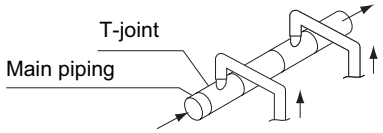
5.1.5 Precautions for Piping

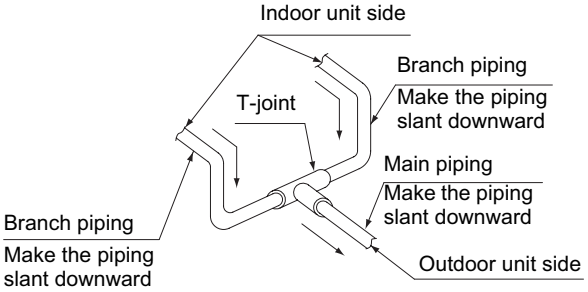
Perform piping branching with the following conditions kept in mind.

- At the time of branching the liquid piping, use a T-joint or Y-joint and branch it horizontally. This will prevent an uneven flow of refrigerant.
- At the time of branching gas piping, use a T-joint and branch it so that the branched piping will be located above the main piping (see the illustration below). This will prevent the stay of refrigerant oil in the indoor unit not in operation.
- Use a Y-joint for the liquid refrigerant branch and have the piping branch horizontally.



- Use a T-joint for the gas refrigerant branch and connect from the top of the main piping.



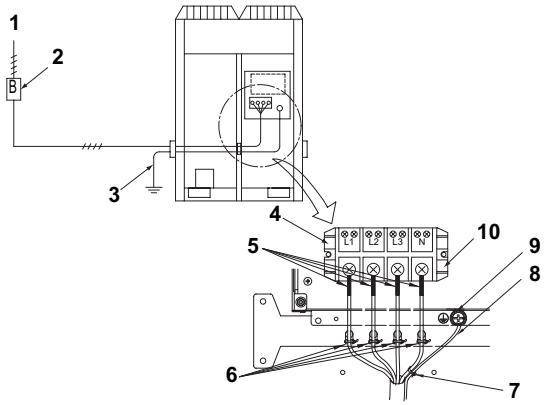


- Make sure that the horizontal portion of the gas piping slants downward to the outdoor unit (see the illustration above).
- If the outdoor unit is located above, make a trap on the gas pipe at 5 m intervals from outdoor unit. This will ensure the smooth returning of oil in the piping slanting upward.

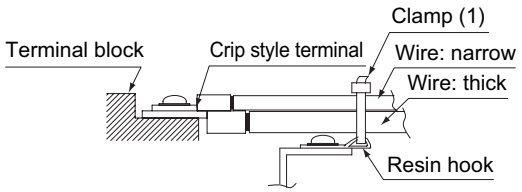
5.2 Field Wiring

5.2.1 Procedure for Power Supply Wiring

〈**Procedure for Power Supply Wiring**〉



1 Power supply (3ϕ 380~415)
2 Branch switch or overcurrent circuit breaker (earth leakage circuit breaker)
3 Earth wire
4 Power supply terminal block
5 Mount insulation sleeves
6 Fix the power supply wiring for phases L1, L2, L3, and N, respectively, with the provided clamp (1) to the resin clamp.
7 Fix the earth wire to the power supply wire (phase N) with the provided clamp (1).
8 Earth wire
Perform wiring so that the earth wire will not come in contact with lead wires of the compressor. Otherwise, noise generated may have a bad influence on other equipment.
9 Ground terminal
10 • When two wires are connected to a single terminal, connect them so that the rear sides of the crimp contacts face each other.
• Also, make sure the thinner wire is on top, securing the two wires simultaneously to the resin hook using the accessory clamp (1).



Power circuit, safety device, and cable requirements

- A power circuit (see the following table) must be provided for connection of the unit. This circuit must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an earth leakage circuit breaker.
- When using residual current operated circuit breakers, be sure to use a high-speed type (1 second or less) 200mA rated residual operating current.
- Use copper conductors only.
- Use insulated wire for the power cord.
- Select the power supply cable type and size in accordance with relevant local and national regulations.
- Specifications for local wiring are in compliance with IEC60245.
- Use wire type H05VV when protected pipes are used.
- Use wire type H07RN-F when protected pipes are not used.

	Phase and frequency	Voltage	Minimum circuit amp.	Recommended fuses
LRMEQ5AY1 LRLEQ5AY1	ϕ3, 50Hz	380-415V	12.7A	15A
LRMEQ6AY1 LRLEQ6AY1	ϕ3, 50Hz	380-415V	13.6A	15A
LRMEQ8AY1 LRLEQ8AY1	ϕ3, 50Hz	380-415V	19.2A	25A
LRMEQ10AY1 LRLEQ10AY1	ϕ3, 50Hz	380-415V	21.9A	25A
LRMEQ12AY1 LRLEQ12AY1	ϕ3, 50Hz	380-415V	23.9A	25A
LRMEQ15AY1 LRLEQ15AY1	ϕ3, 50Hz	380-415V	31.2A	40A
LRMEQ20AY1 LRLEQ20AY1	ϕ3, 50Hz	380-415V	34.8A	40A

Point for attention regarding quality of the public electric power supply

This equipment complies with respectively:

- EN/IEC61000-3-11(1) provided that the system impedance Z_{sys} is less than or equal to Z_{max} and
- EN/IEC61000-3-12(2) provided that the short-circuit power S_{sc} is greater than or equal to the minimum S_{sc} value

at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure. by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with respectively:

- Z_{sys} less than or equal to Z_{max} and
- S_{sc} greater than or equal to the minimum S_{sc} value.

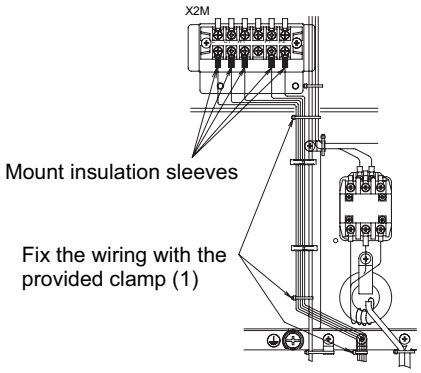
	Z_{max} (Ω)	minimum S_{sc} value
LRMEQ5AY1 LRLEQ5AY1	–	–
LRMEQ6AY1 LRLEQ6AY1	–	–
LRMEQ8AY1 LRLEQ8AY1	0.27	652kVA
LRMEQ10AY1 LRLEQ10AY1	0.27	896kVA
LRMEQ12AY1 LRLEQ12AY1	0.27	1093kVA
LRMEQ15AY1 LRLEQ15AY1	0.24	757kVA
LRMEQ20AY1 LRLEQ20AY1	0.24	941kVA

(1) European/International Technical Standard setting the limits for voltage changes. Voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current ≤ 75A

(2) European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16A and ≤ 75A per phase.

Warning, alarm, and operation output wiring connections

- Connect warning, alarm, and operation output wiring to the X2M terminal block and clamp as indicated by the following diagram:

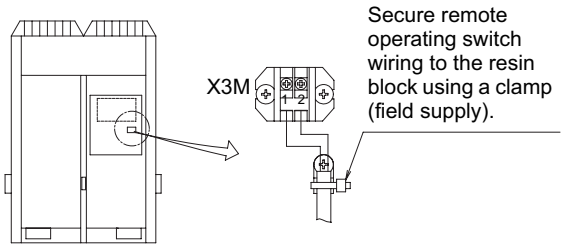


X2M wire specifications

Electric wire thickness	0.75~1.25mm^2
Max. wiring length	130m

Remote operating switch wiring connections

- When installing a remote operating switch, clamp as indicated by the following diagram:



X3M wire specifications

Electric wire thickness	0.75~1.25mm^2
Max. wiring length	130m

Caution

- For Remote switch, use non-voltage contact for microcurrent (not more than 1mA, 12VDC)
- If the remote operating switch will be used to start and stop the unit, set the operating switch to “REMOTE”.

5.3 Inspection and Pipe Insulation

For piping work contractor, electrical work contractor, and trial run workers

- Never open the shutoff valve until the insulation measurement of the main power supply circuit is finished. The measured insulation value will become lower if the measurement is made with the shutoff valve opened.
- On completion of inspection and refrigerant charging, open the shutoff valve. The compressor will malfunction if the condensing unit is operated with the shutoff valve closed.

5.3.1 Air tight Test/Vacuum Drying

Refrigerant is enclosed in the unit.
Be sure to keep both liquid and gas shutoff valves closed at the time of an airtight test or vacuum drying of the local piping.

[For piping work contractor]
On completion of piping work, make the following inspection precisely.

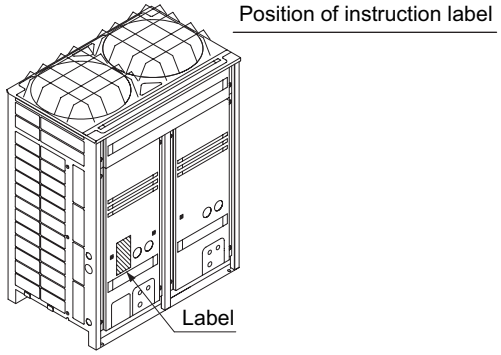
- To ensure that the condensing unit withstand pressure properly and prevent the penetration of foreign substances, be sure to use R410A-dedicated tools.

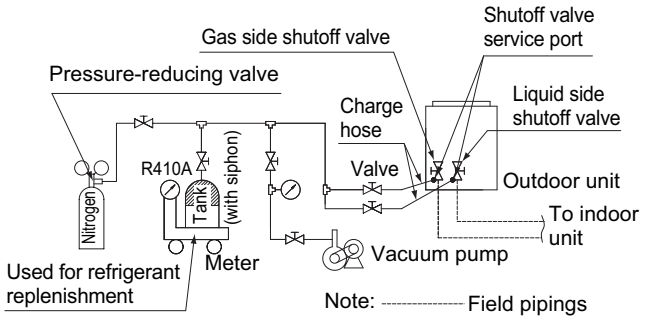
Gauge manifold Charge hose	■ To ensure that the condensing unit withstand pressure properly and prevent the penetration of foreign substances (water, dirt, and dust), use an R410A-dedicated gage manifold and charge hose. R410A-dedicated tools and R407C-dedicated tools are different in screw specification.
Vacuum pump	■ Pay the utmost attention so that the pump oil will not flow backward into the system while the pump is not in operation. ■ Use a vacuum pump that can vacuum down to –100.7kPa (5 Torr or –755mmHg).
Gas for airtight test use	■ Nitrogen gas

- **Air tight**
  Pressurize the high-pressure section of the system (liquid piping) to 3.8 MPa (38 bar) and the low-pressure section of the system (gas piping) to the design pressure (*1) of the indoor unit (field supply) from the service port (*2) (do not exceed the design pressure). The system is considered to have passed if there is no decrease in the pressure over a period of 24 hours.
  If there is a decrease in the pressure, check for and repair leaks.
- **Vacuum drying**
  Connect a vacuum pump to the service ports (*) of both the liquid and gas pipes for at least 2 hours and vacuum the unit down to –100.7 kPa or below. Then leave the unit for at least 1 hour at a pressure of –100.7 kPa or below and check that the vacuum gage reading will not rise. If the pressure rises, there is residual water in the system or the system has leakage.

*1 Contact the manufacturer in advance for more information about the design pressure of the indoor unit (field supply).

*2 Refer to the instruction label on the front panel of the outdoor unit (below) for the position of the service port.





Connection procedure for gauge manifold and vacuum pump

Caution

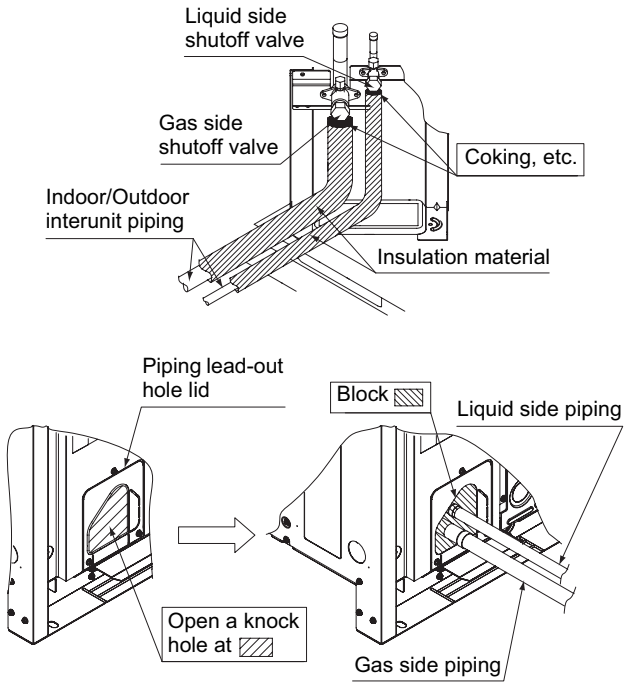
- Conduct an airtight test and vacuum drying precisely through the service ports of both liquid and gas shutoff valves.
- Use charge hoses (provided with a pushing rod each) when using the service ports.

In case of possible water intrusion into piping

Perform the above mentioned vacuum drying for 2 hours first in the following cases:
The product is installed in the rainy season, there is a fear of dew condensation resulting in the piping because the installation work period is long, or there is a fear of rainwater intrusion into the piping for other reasons.
Then **impose a pressure of up to 0.05 MPa** with nitrogen gas (for vacuum destruction) and **vacuum the unit down to –100.7 kPa or below for 1 hour with a vacuum pump** (for vacuum drying).
Repeat vacuum destruction and vacuum drying if the pressure does not reach –100.7 kPa or below after a minimum of 2 hours' vacuuming. Leave the vacuum state for 1 hour then, and check that the vacuum gauge reading will not rise.

5.3.2 Thermal Insulation Work

- Be sure to perform thermal insulation of the piping after the airtight test and vacuum drying.
- Be sure to perform the thermal insulation of the liquid and gas pipes in the connecting piping. Otherwise, water leakage may result.
- Be sure to insulate liquid and gas connection piping. Failure to do so may result in water leakage. Consult the following chart as a general guide when selecting the insulation thickness.
- Liquid pipe arrival minimum temperature –10°C
  Gas pipe arrival minimum temperature
  –20°C (MT (Medium Temperature))
  –40°C (LT (Low Temperature))
- Reinforce the insulation material for the refrigerant piping according to the environment of thermal installation. Otherwise, the surface of the insulation material may result in dew condensation.
- If the dew condensation water on the shutoff valves is likely to flow to the indoor unit side through the clearance between the insulation material and piping because the outdoor unit is installed above the indoor unit or for some other reasons, perform appropriate treatment such as the caulking of the joints (see the illustrations below).
- Attach the cover of the piping outlet with a knock hole opened. If there is a feature of small animals intruding through the piping outlet, cover the piping outlet with a blocking material (field supply) on completion of the steps of "**5.5 Additional Refrigerant Charge**" (see the illustrations below).
  Use the piping outlet for jobs required during the steps of "**5.5 Additional Refrigerant Charge**" (e.g., a job of taking in the charge hose).



Note: ■ After knocking out the holes, we recommend you remove burrs in the knock holes and paint the edges and areas around the edges using the repair paint.

5.3.3 Checking of Device and Installation Conditions

Be sure to check the followings.

<For those doing electrical work>

1. Make sure there is no faulty power wiring or loosing of a nut.
   See "**5.2.1 Procedure for Power Supply Wiring**".
2. Has the insulation of the main power circuit deteriorated?
   Measure the insulation and check the insulation is above regular value in accordance with relevant local and national regulations.

<For those doing pipe work>

1. Make sure piping size is correct.
   See "**5.1.2 Selection of Piping Material**".
2. Make sure insulation work is done.
   See "**5.3.2 Thermal Insulation Work**".
3. Make sure there is no faulty refrigerant piping.
   See "**5.1. REFRIGERANT PIPING**".

5.4 Checks after Work Completion

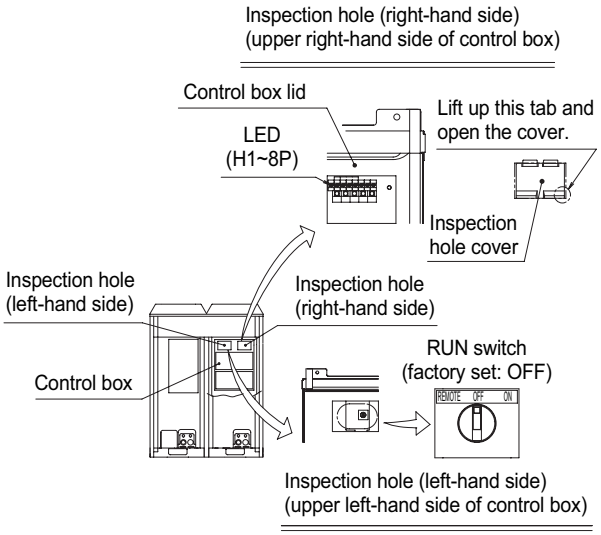
- Make sure the following works are complete in accordance with the installation manual.
  - Piping work
  - Wiring work
  - Air tight test/Vacuum drying
  - Installation work for indoor unit

5.5 Additional Refrigerant Charge

For refrigerant filling contractor
Use R410A for refrigerant replenishment.
The R410A refrigerant cylinder is painted with a pink belt.

Warning **Electric Shock Warning**

- Securely close the control box lid before turning power on.
- Before turning power on, check through the inspection hole (on the left-hand side) of the control box lid that the RUN switch is set to OFF.
  If the RUN switch is set to ON, the fan may rotate.
- Check the LED indicators on the PCB (A1P) of the outdoor unit through the inspection hole (on the right-hand side) of the control box lid after the outdoor unit is turned on (see the illustration).
  (The compressor will not operate for approximately 2 minutes after the outdoor unit is turned on.
  H2P blinks for the first five seconds when the power supply is turned on. If the equipment is normal, H2P will be turned off in five seconds. H2P lights for abnormality.)



Warning

- Use protective gear (e.g., protective gloves and glasses) at the time of refrigerant filling.
- Pay attention to the rotation of the fan whenever the front panel is opened while working.
  The fan can rotate continuously for a while after the outdoor unit stops operating.

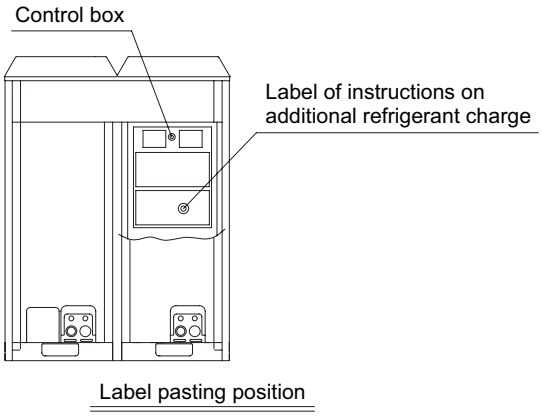
[Additional Refrigerant Charge]

Caution

- Refer to the **Operation Method of Shutoff Valves** for the control method of the shutoff valves.
- **Never charge liquid refrigerant directly from a gas line. Liquid compression may cause the compressor to fail.**

1. The refrigerant must be noted for this product. Calculate the amount of additional refrigerant charge according to the label for the calculation of the amount of additional refrigerant charge.
2. Take the following procedure for additional refrigerant charge.
   Refer to "**5.3.1 Airtight Test/Vacuum Drying**" for the connection of the refrigerant cylinder.

(1) Turn on the indoor unit and control panel.
   Do not turn on the outdoor unit.
(2) Charge additional refrigerant from the service port of the shutoff valve on the liquid side.
(3) If the calculated amount of refrigerant cannot be filled, take the following steps to operate the system and continue additional refrigerant charge.
   a. Open the gas shutoff valve all the way and adjust the opening of the liquid shutoff valve (*1).
   b. **[Warning/Electric Shock Warning]**
      Turn on the outdoor unit.
   c. **[Warning/Electric Shock Warning]**
      Turn on the RUN switch of the outdoor unit and replenish refrigerant while the outdoor unit is in operation.
   d. Turn off the RUN switch of the outdoor unit after the specified amount of refrigerant is replenished.
   e. **[Caution]**
      Fully open the shutoff valves on the gas and liquid sides promptly. Otherwise, a piping explosion may result from liquid sealing.

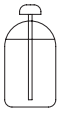
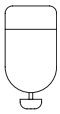


*1 The cylinder's internal pressure will drop when there is little refrigerant remaining in the cylinder, making it impossible to charge the unit, even if the liquid shutoff valve opening is adjusted. In this situation, replace the cylinder with one that has more refrigerant remaining. Additionally, if the piping length is long, additional charging while the liquid shutoff valve is fully closed may lead to activation of the protection system, causing the unit to stop operation.

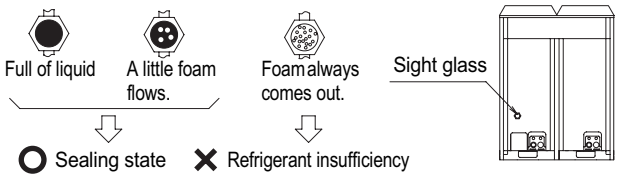
1. After the work is completed, apply a screw lock agent (for flare nuts) to the screws of the shutoff valves and service ports.
2. After the additional refrigerant charge is completed, fill out the item "total amount of additional refrigerant charge" on the label of instructions on additional refrigerant charge of the outdoor unit with the actual amount of additional refrigerant charge.
   Refer to the illustration of the label pasting position for instructions on additional refrigerant charge (see the illustration on the above).

[Precautions for refrigerant cylinder]

At the time of refrigerant filling, check whether the siphon tube is provided. Then locate the cylinder so that the refrigerant will be filled in the state of liquid (see table below).
R410A is a mixed refrigerant, the composition of which may change and the normal operation of the system may not be possible if the refrigerant is filled in the state of gas.

Cylinder provided with siphon tube.	
	Stand the cylinder upright and fill the refrigerant. (There is a siphon tube inside, which makes it possible to replenish the refrigerant in the state of liquid without setting the cylinder upside down.)
Other cylinders	
	Stand the cylinder upside down and fill the refrigerant. (Pay attention so that the cylinder will not topple down.)

[Check through sight glass]



Caution

- **Fully open the shutoff valves on the liquid and gas sides after the additional refrigerant charge is finished.**
  The compressor will malfunction if the system is operated with the shutoff valves closed.
- **Apply a screw lock agent to the screws of the valve cover mounting parts and service ports.**
  (Otherwise, dew condensation water will intrude and freeze inside and cause cap deformation or damage, which may result in refrigerant gas leakage or compressor malfunctions.)

5.6 Test Run

For test run operators

Do not operate the outdoor unit alone on a trial basis.

Test run procedure

Use the following procedure to perform a test run after installation work is complete for the entire system:

1. Fully open the shutoff valves on the gas and liquid sides of the outdoor unit.
2. Set the RUN switch of the outdoor switch to ON.
   Note: Before turning power on, check that the piping cover and control box lid of the outdoor unit are closed.
3. Check the sealing condition of the outdoor unit through the sight glass. Make sure that the amount of refrigerant is sufficient.
4. Make sure that cold air blows from the indoor unit.
   Check that the internal temperature is dropping.
   (Check that the temperature will drop and reach the set temperature in the internal unit. It will take approximately 40 minutes for the interior temperature of the internal unit to reach –20°C.)
   Check that the indoor unit (for refrigeration or freezing) goes into defrosting operation.
5. Turn power off with the RUN switch of the outdoor unit set to OFF.
   (Stopping unit operation by disconnecting the power supply directly is dangerous. When the unit is stopped in this manner, its power outage compensation function may cause it to resume operation as soon as the power supply is reactivated. Additionally, stopping the unit in this manner may cause the compressor to fail).

Error diagnosis

- If the system cannot operate normal at the time of test run (i.e., the H2P indicator is lit), check with malfunction code on the system with the pushbutton switches on the PCB of the outdoor unit, and take the following steps.
- Make checks on other malfunction codes and pushbutton switches by referring to the provided Technical Guide.

LED indication															Installation failure	Remedy
(BS3 switch pressed once)							(BS2 switch pressed once)									
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P			
◑	●	○	●	●	◑	◑	◑ or ◑	○	●	●	●	◑	◑ ● ●		The shutoff valves were left closed.	Fully open the shutoff valves.
◑	●	○	●	◑	◑	◑	◑	○	●	●	◑	●	●		The passage of air is blocked.	Remove obstacles that block the passage of air.
◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	◑		Reverse-phase wiring of power supply	Exchange two wires out of the three power supply wires.
◑	●	○	◑	●	●	◑	◑	○	●	●	●	◑	●		Voltage drop	Make a voltage drop check.
◑	●	○	●	◑	◑	◑	◑	○	●	◑	●	●	◑			
◑	●	○	●	●	◑	◑	◑	○	●	●	●	◑	●		Electric leak	See *1 below.
◑	●	○	●	◑	◑	◑	◑	○	●	◑	◑	●	●		Open L2 phase	Verify power supply wiring connections.
◑	●	○	●	◑	●	●	◑	○	●	●	●	◑	◑			
Normal monitor (HAP) LED off.															Open L1 phase	

● OFF ○ ON ◑ BLINK

*1

Set the operating switch to the “OFF” position to reset the power supply and then return the switch to the “ON” position to restart the unit. If the problem persists, refer to the Service Manual.

Caution

- Do not disconnect the power supply for 1 minute after setting the operating switch to “ON”. Electric leak detection is performed for several seconds after the operating switch is set to “ON” and each compressor starts operating, so disconnecting the power supply during that time will result in a false detection.

6. Troubleshooting

6.1 Checking Points at Servicing

■ **Symptoms and check points**

Symptoms	Check points	Countermeasure and check details
Temperature inside the showcase is at abnormal level.	Is the outdoor unit running?	Check the operation switch, signal line R1·R2 and malfunction display.
	Is the sight glass liquid-sealed (in cooling)?	Charge refrigerant.
	Is the showcase's fan running?	Check the disconnection, and malfunction. (in the showcase)
	Is the showcase's solenoid valve operating properly?	Rectify the solenoid valve.
	Is the showcase's thermostatic expansion valve operating properly? (No broken capillaries?)	Check the state of mounting the body and feeler bulb.
	Is the defrost operation conducted properly? (No excessive frosting?)	Actuate the forced defrosting. Check the defrosting cycle and the disconnection in the heater.
	Is the outdoor unit heat exchanger blocked with dust or the like?	Clean the heat exchanger.
	Is the air curtain blocked at the air outlet or inlet of showcase?	Remove the obstacles.
Equipment does not run.	Check to be sure the malfunction code on the remote controller.	Countermeasure to the malfunction code.
	Check to be sure the malfunction LED display on the outdoor unit PCB.	Countermeasure to the malfunction LED display.

■ **The following symptoms are not malfunctions**

Symptoms		Causes
Equipment does not operate.	When the equipment is restart immediately after it stops.	The equipment is controlled in an affordable way. The equipment will automatically start running after a lapse of 1 to 5 min.
	Immediately after power supply in turned ON.	The equipment is kept in standby mode until the micro-computer gets ready for operation. Wait for a period of approx. 2 min.
Sounds are produced.	(Outdoor unit) A faint continuous hissing sound produced while in refrigerating operation.	This is a sound produced when gas (refrigerant) flows to the outdoor unit.
	(Outdoor unit) A faint continuous hissing sound produced immediately after startup or stop of the unit.	This is a sound when gas (refrigerant) stops flowing or the flow is changed.
	(Outdoor unit) An operating sound changes in the tone interval.	This sound is produced through changing the compressor operating frequency.
The outdoor unit fan does not run.	While in operation.	The fan speed is controlled in order to put the equipment into optimum operating conditions.

1. Guideline for right operating conditions.

Item	Measuring method	Right range
High pressure (MPa)	Measure with a service checker or pressure gauge in a stable state 20 minutes or more after starting operation.	2.1 - 2.7 MPa
Low pressure (MPa)	Measure with a service checker or pressure gauge in a stable state 20 minutes or more after starting operation.	0.0 MPa to target LPm + 0.05 MPa
Discharge pipe temperature (°C)	Measure the temperature using a surface thermometer or service checker.	(Tc + 10) to 120°C Tc: high pressure equivalent saturation temperature
Suction pipe temperature (°C)	Measure the temperature using a surface thermometer or service checker.	(Te + 10) to 50°C Te: low pressure equivalent saturation temperature

Operating conditions: outdoor temp.: 32°CD.B.
Note that the values shown above may vary significantly, depending on the environment in which the unit is being used.

2. Emergency operation in the case of a compressor with poor electrical insulation (This only applies to a system with multiple compressors.)

Usually, if a compressor stops because of a problem, the system will automatically perform a backup operation (i.e., emergency operation) using other, properly-functioning compressors. However, if the source breaker trips due to poor electrical insulation of a compressor, the whole system will shut down and no backup operation will be possible.
If this happens, you need to run the other working compressors using the following procedures.

2-1. Procedure of emergency operation

Operating the main circuit breaker twice makes it possible to conduct the forced backup operation. (i.e., to prohibit the operation of compressors having a failure in insulation and only to forcedly run operable compressors.)

(Procedures)

1. Set the main circuit breaker of the outdoor unit to ON.

   Restarting operation will make automatic judgement on the insulation conditions of parts concerned again.
   ↓
   "Malfunction judgement":
   The main circuit breaker will be set to OFF again.

   → "Normal judgement": The operation will be continued.

2. Set the main circuit breaker to ON again.
   (The forced backup operation will be initiated.)

Precautions:

The timing to turn OFF the circuit breaker varies with faulty parts.
If the INV compressor has a failure in insulation, the circuit breaker will be immediately activated. However, if the STD compressor has a failure in insulation, it may take time to activate the circuit breaker due to loads applied.

2-2. Procedures to be taken after beginning emergency operation until compressor replacement is complete and normal operation resumes

1. Change the outdoor unit operation switch from "LOCAL" or "REMOTE" to "OFF".
2. Turn off the outdoor unit's main breaker.
3. Replace the defective compressor with a new one.
4. Turn the outdoor unit breaker back on.
   (*Make sure that the operation switch is set to "OFF" before turning on the main breaker.)
5. Change the outdoor unit operation switch from "OFF" to "LOCAL" or "REMOTE".

3. Contact our service department for details about the setting procedures for the AIRNET and service checker, and the precautions for use.

3-1. When using the AIRNET:

- Specify the outdoor unit AirNet address settings (Setting Mode 2-06).
- Specify the virtual indoor unit address settings (Setting Mode 2-16).
  (The settings described above are necessary even if you are not using the AIRNET, but are using an ST controller.)
  (Contact our service department when connecting a system to a VRV or other systems.)

3-2. When using a service checker:

- Specify the virtual indoor address settings (Setting Mode 2-16).

Note:

- Be sure to stop the system operation (compressors) before running a test of the AIRNET or using a service checker.

6.2 List of Malfunction Codes

No.	Item	Code (Remote control display)	Detection device	Criteria	Times of retry	LRMEQ5, 6AY1 LRLEQ5, 6AY1			LRMEQ8, 10, 12AY1 LRLEQ8, 10, 12AY1			LRMEQ15, 20AY1 LRLEQ15, 20AY1			Remarks
						Level	Mal-function output	Output during backup	Level	Mal-function output	Output during backup	Level	Mal-function output	Output during backup	
1	STD compressor OC activation	E0	Current sensor	14.95A	2	—	—	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
2	Earth leakage	E2	• Leakage breaker	• Earth leakage breaker activates within 20 seconds after compressor startup	0	Shutdown	—	ON	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
			• Leakage detector PCB	• Leakage detector PCB is activated when HP<3.6MPa											
3	Abnormal high pressure level	E3	• High pressure switch	• 3.8MPa or more	0	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
			• High pressure sensor	• 3.55MPa or more	3	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	
					5	—	—	—	Shutdown	ON	—	Alarm	—	ON	
					7	—	—	—	—	—	—	Shutdown	ON	—	
4	Abnormal low pressure level	E4	Low pressure sensor	SW5 is OFF • 0MPa or less (MT) • -0.015MPa or less (LT)	4	Shutdown	ON	—	Shutdown	ON	—	Shutdown	ON	—	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF" Refer to P.56 "(10) Low pressure protection control".
5	INV compressor lock	E5	Inverter PCB	Position signal error	4	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
6	Outdoor fan motor malfunction	E7	Fan driver PCB	Irregular fan motor revolution	4	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
7	Electronic expansion valve malfunction	E9	Main PCB	No continuity of electronic expansion valve coil	0	Shutdown	ON	—	Shutdown	ON	—	Shutdown	ON	—	Manual reset "Reset the power supply"
8	Abnormal discharge pipe temperature	F3	Discharge pipe thermistor	• Discharge pipe temp. >150°C	0	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
				• Discharge pipe temp. >120°C continuously for 70 sec. or more • Discharge pipe temp. >125°C continuously for 30 sec. or more • Discharge pipe temp.>130°C	14	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	
				Discharge pipe temp. >110°C, and EV2_pls≥450 pls, and EV3_pls≥450 pls continuously for 60 sec.	3	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	
					5	—	—	—	Shutdown	ON	—	Alarm	—	ON	
					7	—	—	—	—	—	—	Shutdown	ON	—	
9	3-sensor malfunction	H0	Outdoor air thermistor Suction pipe thermistor Discharge pipe thermistor Heat exchanger intermediate inlet thermistor Heat exchanger intermediate outlet thermistor High pressure sensor Low pressure sensor	When 3 or more sensors detect abnormality	0	Shutdown	ON	—	Shutdown	ON	—	Shutdown	ON	—	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
10	High pressure switch failure	H3	Main PCB	No continuity of high pressure switch	0	Shutdown	ON	—	Shutdown	ON	—	Shutdown	ON	—	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
11	INV malfunction	L1	Inverter PCB	Malfunction of IGBT or INV is defected four times in an hour	0	Shutdown	ON	—	Shutdown	ON	—	Shutdown	ON	—	Manual reset "Reset the power supply"
12	Radiating fin temperature rise	L4	Inverter PCB	94°C	9	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
13	INV compressor instantaneous overcurrent	L5	Inverter PCB		9	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
14	INV compressor overcurrent	L8	Inverter PCB	16.1A or more	9	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
15	Faulty INV compressor startup failure	L9	Inverter PCB		2	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
16	Transmission failure between control PCB and inverter PCB	LC	Inverter PCB	Transmission failure between main PCB and inverter PCB	No limit	Alarm	—	ON	Alarm	—	ON	Alarm	—	ON	Automatic reset
17	INV compressor power voltage imbalance	P1	Inverter PCB		9	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"
18	Radiation fin thermistor	P4	Inverter PCB	Fin thermistor open circuit or short circuit	No limit	Alarm	—	ON	Alarm	—	ON	Alarm	—	ON	Automatic reset
19	Reversed phase / Open phase	U1	Main PCB	Reversed phase or open phase	0	Shutdown	ON	—	Shutdown	ON	—	Shutdown	ON	—	Manual reset "Reset the power supply"
20	INV compressor abnormal power voltage	U2	Inverter PCB		9	Shutdown	ON	—	Alarm	—	ON	Alarm	—	ON	Manual reset "Reset the power supply" or "Turn the operation switch ON to OFF"

6.3 Checking Malfunction Codes by LED Lamps on PCB

1) Simple diagnosis by the LED error display

In Setting Mode 1-11, the error status of each component can be checked by reading the blinking LED.

[Steps]

Operate the pushbuttons on the PCB (in Setting Mode 1) and malfunction codes will be displayed by LEDs.

Follow the steps below to check your unit.

1. Press the MODE button (BS1). (Setting Mode 1 will be entered.)
2. Pressing the SET button (BS2) will go to item No.1 (see the list of output items).
3. Pressing the RETURN button (BS3) will display any error for item No.1 using the LED (Normal: OFF, Error: Blinking).
4. Pressing the MODE button (BS1) will go back to the initial state.

2) In Setting Modes 1-14 and on, it is possible to use the LED to check the error and retry details, using the same steps as previously described (see the next page).

NO	Setting	Large item	Middle item	Small item	Description
1	Setting Mode 1, No. 1	Malfunction output	System	Reversed phase	H7P blinks when reversed phase is detected.
2	Setting Mode 1, No. 1			INV earth leakage	H6P blinks when INV earth leakage is detected.
3	Setting Mode 1, No. 1			STD1 earth leakage	H5P blinks when STD1 earth leakage is detected.
4	Setting Mode 1, No. 1			STD2 earth leakage	H4P blinks when STD2 earth leakage is detected.
5	Setting Mode 1, No. 2		EV	EV1	H7P blinks when EV1 error occurs.
6	Setting Mode 1, No. 2			EV2	H6P blinks when EV2 error occurs.
7	Setting Mode 1, No. 2			EV3	H5P blinks when EV3 error occurs.
8	Setting Mode 1, No. 3		Pressure sensor	HP	H5P blinks when HP sensor error occurs.
9	Setting Mode 1, No. 3			LP1	H7P blinks when LP1 sensor error occurs.
10	Setting Mode 1, No. 4		Temperature sensor 1	Td1	H7P blinks when Td1 sensor error occurs.
11	Setting Mode 1, No. 4			Td2	H6P blinks when Td2 sensor error occurs.
12	Setting Mode 1, No. 4			Td3	H5P blinks when Td3 sensor error occurs.
13	Setting Mode 1, No. 4			Ti1	H4P blinks when Ti1 sensor error occurs.
14	Setting Mode 1, No. 5		Temperature sensor 2	Ta	H7P blinks when Ta sensor error occurs.
15	Setting Mode 1, No. 5			Tg	H6P blinks when Tg sensor error occurs.
16	Setting Mode 1, No. 5			TL	H5P blinks when TL sensor error occurs.
17	Setting Mode 1, No. 6		Current sensor	CT1	H7P blinks when CT1 sensor error occurs.
18	Setting Mode 1, No. 6			CT2	H6P blinks when CT2 sensor error occurs.
19	Setting Mode 1, No. 7		Protection device	HPS	H7P blinks when HPS is detected.
20	Setting Mode 1, No. 7			HPSL	H6P blinks when HPSL is detected.
21	Setting Mode 1, No. 8		Transmission	INV	H7P blinks when INV transmission error occurs.
22	Setting Mode 1, No. 9		INV error 1	L1	H7P blinks when L1 error occurs.
23	Setting Mode 1, No. 9			L4	H6P blinks when L4 error occurs.
24	Setting Mode 1, No. 9			L5	H5P blinks when L5 error occurs.
25	Setting Mode 1, No. 9			L8	H4P blinks when L8 error occurs.
26	Setting Mode 1, No. 9			L9	H3P blinks when L9 error occurs.
27	Setting Mode 1, No. 10		INV error 2	E5	H7P blinks when E5 error occurs.
28	Setting Mode 1, No. 10			U2	H6P blinks when U2 error occurs.
29	Setting Mode 1, No. 10			P1	H5P blinks when P1 error occurs.
30	Setting Mode 1, No. 10			P2	H4P blinks when P2 error occurs.
31	Setting Mode 1, No. 11		Malfunction of fan	E7 (FAN1)	H7P blinks when E7 error occurs.
32	Setting Mode 1, No. 11			H7 (FAN1)	H6P blinks when H7 error occurs.
33	Setting Mode 1, No. 11			E7 (FAN2)	H7P blinks when E7 error occurs.
34	Setting Mode 1, No. 11			H7 (FAN2)	H6P blinks when H7 error occurs.
35	Setting Mode 1, No. 14	Malfunction output	Malfunction contents (latest)	—	0~63 (6bit) (See the list of malfunction codes.)
36	Setting Mode 1, No. 15		Malfunction contents (one before)	—	0~63 (6bit) (See the list of malfunction codes.)
37	Setting Mode 1, No. 16		Malfunction contents (two before)	—	0~63 (6bit) (See the list of malfunction codes.)
38	Setting Mode 1, No. 17		Software number display	—	0~63 (6bit)
39	Setting Mode 1, No. 18		HP	—	0~63 (6bit)
40	Setting Mode 1, No. 19		Software version display	—	0~63 (6bit)
41	Setting Mode 1, No. 20		Retry description (latest)	—	0~63 (6bit) (See the list of malfunction codes.)
42	Setting Mode 1, No. 21		Retry description (one before)	—	0~63 (6bit) (See the list of malfunction codes.)
43	Setting Mode 1, No. 22		Retry description (two before)	—	0~63 (6bit) (See the list of malfunction codes.)

6.4 Checking Malfunction Codes of the Condensing Unit

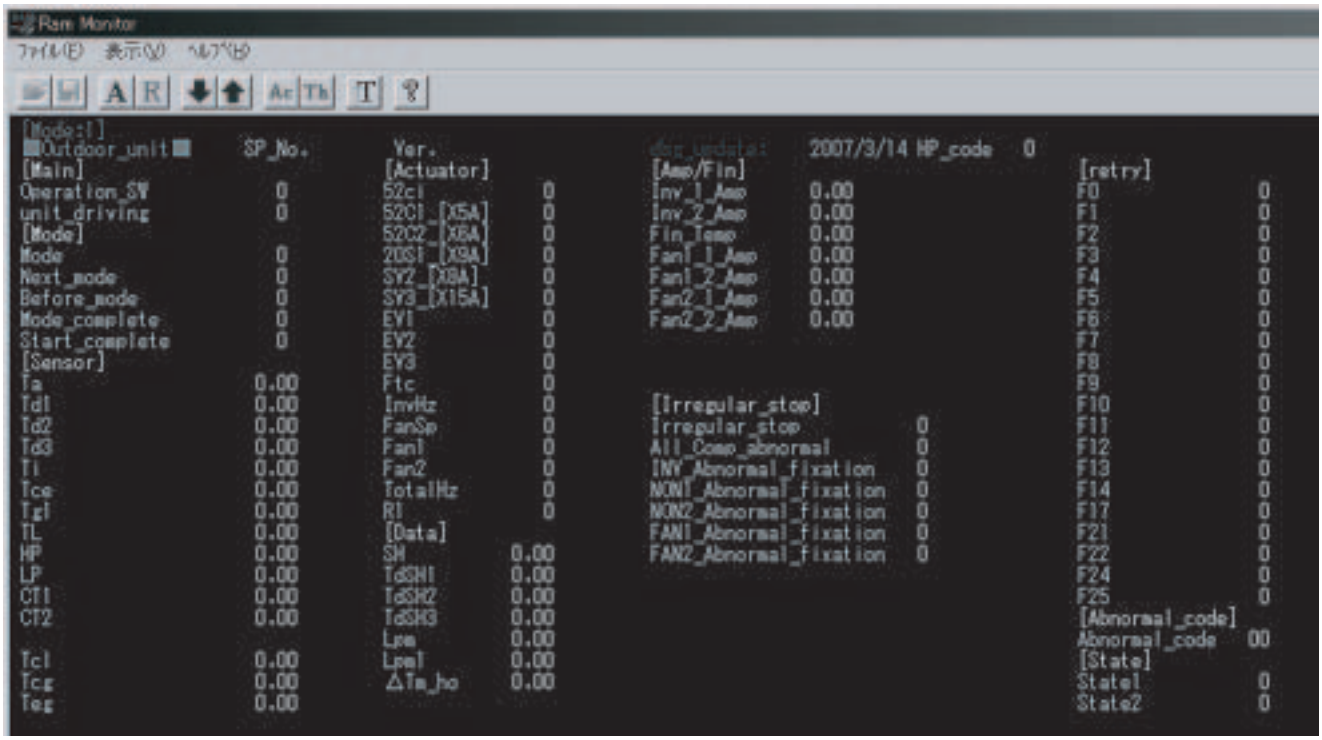
Operate the pushbuttons on the PCB and malfunction codes will be displayed by LEDs.
Setting Modes: 1-14, 15, 16, 20, 21, 22
[Steps]

1. Make sure that the "H1P" LED is OFF.
   (If the LED is ON, press the MODE button (BS1) once.)
2. Press the MODE button (BS1) once to enter the "monitor mode".
3. Pressing the RETURN button (BS3) will display the first digit of a malfunction code by LED.
4. Pressing the SET button (BS2) will display the second digit of the malfunction code by LED.
5. Pressing the MODE button (BS1) will go back to the former state.

LED display (Pressing the BS3 switch once)							LED display (Pressing the BS2 switch once)							Remote controller display	Malfunction contents	Page referred
H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P			
◑	●	○	●	●	◑	◑	◑	○	●	●	●	●	●	E0	STD Compressor Motor Overcurrent/ Lock	P.84
										●	●	◑	●	E2	Earth Leakage	P.86
										●	●	◑	◑	E3	Actuation of High Pressure Switch	P.88
										●	◑	●	●	E4	Actuation of Low Pressure Sensor	P.90
										●	◑	●	◑	E5	Inverter Compressor Motor Lock	P.92
										●	◑	◑	◑	E7	Malfunction of Outdoor Unit Fan Motor	P.94
										◑	●	●	◑	E9	Malfunction of Electronic Expansion Valve Coil	P.97
◑	●	○	●	◑	●	◑	◑	○	●	●	●	◑	◑	F3	Abnormal Discharge Pipe Temperature	P.99
◑	●	○	●	◑	●	●	◑	○	●	●	●	●	●	H0	Three-sensor Malfunction	P.101
										●	●	◑	◑	H3	Malfunction Related to High Pressure Switch	P.103
										●	◑	◑	◑	H7	Abnormal Outdoor Fan Motor Signal	P.104
										◑	●	●	◑	H9	Malfunction of Outdoor Air Thermistor	P.106
◑	●	○	●	◑	◑	●	◑	○	●	●	●	◑	●	J2	Current Sensor Malfunction	P.107
										●	●	◑	◑	J3	Malfunction of Discharge Pipe Thermistor	P.108
										●	◑	●	◑	J5	Malfunction of Suction Pipe Thermistor	P.108
										◑	●	●	●	J8	Malfunction of Heat Exchanger Intermediate Inlet Thermistor	P.108
										◑	●	●	◑	J9	Malfunction of Heat Exchanger Intermediate Outlet Thermistor	P.108
										◑	●	◑	●	JA	Malfunction of High Pressure Sensor	P.110
										◑	◑	●	●	JC	Malfunction of Low Pressure Sensor	P.112
◑	●	○	●	◑	◑	◑	◑	○	●	●	●	●	◑	L1	Faulty Inverter PCB	P.114
										●	◑	●	●	L4	Malfunction of Inverter Radiating Fin Temperature Rise	P.115
										●	◑	●	◑	L5	INV Compressor Instantaneous Overcurrent	P.116
										◑	●	●	●	L8	INV Compressor Overload	P.118
										◑	●	●	◑	L9	Faulty INV Compressor Startup	P.120
										◑	◑	●	●	LC	Malfunction of Transmission (between Inverter PCB and Main PCB)	P.122
◑	●	○	◑	●	●	●	◑	○	●	●	●	●	◑	P1	Power Supply Voltage Imbalance	P.124
										●	◑	●	●	P4	Faulty Radiation Fin Thermistor	P.125
◑	●	○	◑	●	●	●	◑	○	●	◑	◑	●	◑	PJ	Faulty of Capacity Setting	—
◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	◑	U1	Reverse Phase / Open Phase	P.126
										●	●	◑	●	U2	Abnormal Power Supply Voltage	P.127

6.5 Troubleshooting by RAM Monitor

Using the RAM monitor makes it possible to check the following operating data. Use this monitor for troubleshooting.



SP_No.	SP number
Ver.	Version of software (Used for updating the software for PCB)
Hp_code	The comparison between HP_code and the model on the RAM Monitor screen is as follows. 1:5AY1, 2:6AY1, 3:8AY1, 4:10AY1, 5:12AY1, 6:15AY1, 7:20AY1

[Main]

Operation_SW	OPERATION switch bits (OFF/ON:0/1)
unit_driving	No need for checking because it is not used.

[Mode]

Mode	Present mode of operation
Next_mode	The following mode of operation
Before_mode	The previous mode of operation
Mode_complete	Driving mode completion bits (OFF/ON:0/1)
Start_complete	Start driving completion bits (OFF/ON:0/1)

[Sensor]

Mark on RAM Monitor	Mark of paragraph of trouble repair	Mark of electric wiring diagram chart	Meaning
Ta	Ta	R1T	Ambient temperature thermistor
Td1	Td1	R31T	Discharge temperature thermistor (INV Comp)
Td2	Td2	R32T	Discharge temperature thermistor (STD1)
Td3	Td3	R33T	Discharge temperature thermistor (STD2)
Ti	Ti	R2T	Suction temperature thermistor
Tce	Tce	R3T	Outdoor heat exchanger outlet thermistor
Tg1	Tg	R5T	Subcool heat exchanger outlet thermistor
TL	TL	R6T	Subcool heat exchanger inlet thermistor
HP	HP	S1NPH	High pressure sensor
LP	LP	S1NPL	Low pressure sensor
CT1	—	A6P	Current sensor (STD1)
CT2	—	A7P	Current sensor (STD2)
Tcl	—	—	Liquid side condensation pressure equivalent saturation temperature (calculation value)
Tcg	—	—	Gas side condensation pressure equivalent saturation temperature (calculation value)
Teg	—	—	Gas side evaporation pressure equivalent saturation temperature (calculation value)

[Actuator]

Mark on RAM Monitor	Mark of paragraph of trouble repair	Mark of electric wiring diagram chart	Meaning
52ci	INV	M1C	INV compressor driven bits(OFF/ON:0/1)
52C1_[X5A]	STD1	M2C	STD1 compressor driven bits(OFF/ON:0/1)
52C2_[X6A]	STD2	M3C	STD2 compressor driven bits (OFF/ON:0/1)
20S1_[X9A]	4 WAY VALVE	Y3S	Solenoid valve (4 way valve) bits (OFF/ON:0/1)
SV2_[X8A]	SV2	Y2S	Solenoid valve (STD1) bits(OFF/ON:0/1)
SV3_[X15A]	SV3	Y5S	Solenoid valve(STD2) bits (OFF/ON:0/1)
EV1	EV1	Y1E	Electric expansion valve(main) pulse(0~480)
EV2	EV2	Y2E	Electric expansion valve(Economizer) pulse(0~480)
EV3	EV3	Y3E	Electric expansion valve(INV) pulse(0~480)
Ftc	—	—	INV step
INV_Hz	—	—	INV Hz
Fansp	—	—	Fan step
Fan1	—	M1F	Fan rotation
Fan2	—	M2F	Fan rotation
TotalHz	—	—	Total compressor Hz(STD is calculated as 166Hz)
R1	—	OPERATING OUTPUT	Operating output(For liquid solenoid valve control of showcase) bits (OFF/ON:0/1)

[Data]

Mark on RAM Monitor	Meaning (Calculation value from sensor)
SH	Suction super heat
TdSH1	Discharge super heat(INV)
TdSH2	Discharge super heat(STD1)
TdSH3	Discharge super heat(STD1)
Lpm	Target evaporation temperature equivalent pressure (Lpm is saturation temperature equivalent pressure of Tst. Tst=f(Lpm)=Tsd+ΔTsp+ΔTsn=f(Lpm1)+f(ΔTm)+ΔTsn
Lpm1	Target evaporation temperature equivalent pressure (Lpm1 is saturation temperature equivalent pressure of Tsd.)
ΔTm_ho	ΔTm is an equivalent saturation pressure value of ΔTsp.

[Amp/Fin]

Mark on RAM Monitor	Meaning
Inv_1_Amp	The first inverter current
Inv_2_Amp	The second inverter current
Fin_Temp	Temperature of INV fin
Fan1_1_Amp	The first fan1 current
Fan1_2_Amp	The second fan1 current
Fan2_1_Amp	The first fan2 current
Fan2_2_Amp	The second fan2 current

[Irregular stop]

Mark on RAM Monitor	Meaning
Irregular stop	Irregular stop bits (Normality/abnormality:0/1)
Inv_Abnomal_fixation	Inverter compressor abnormality and fixation bits(Normality/abnormality:0/1)
STD1_Abnomal_fixation	STD1 compressor abnormality and fixation bits(Normality/abnormality:0/1)
STD2_Abnomal_fixation	STD2 compressor abnormality and fixation bits(Normality/abnormality:0/1)
FAN1_Abnomal_fixation	FAN1 compressor abnormality and fixation bits(Normality/abnormality:0/1)
FAN2_Abnomal_fixation	FAN2 compressor abnormality and fixation bits(Normality/abnormality:0/1)

[Retry]

Mark on RAM Monitor	Error code	Meaning
F0	F3	Frequency of retrying of Abnormal Discharge Temperature(system)
F1	F3	Frequency of retrying of Abnormal Discharge Temperature(INV)
F2	F3	Frequency of retrying of Abnormal Discharge Temperature(STD1)
F3	F3	Frequency of retrying of Abnormal Discharge Temperature(STD2)
F4	E3	Frequency of retrying of Actuation of High Pressure Sensor
F5	E4	Frequency of retrying of Actuation of High Pressure Sensor
F6	E6	Frequency of retrying of Actuation of High HPSL
F7	E0	Frequency of retrying of STD1 Compressor Motor Overcurrent/Lock
F8	E0	Frequency of retrying of STD2 Compressor Motor Overcurrent/Lock
F9	E5	Frequency of retrying of Inverter Compressor Motor Lock
F10	L9	Frequency of retrying of Faulty INV Compressor Startup
F11	L8	Frequency of retrying of Inverter Compressor Overload
F12	L5	Frequency of retrying of Inverter Compressor instantaneous Overcurrent
F13	U2	Frequency of retrying of Abnormal Power Supply Voltage
F14	L4	Frequency of retrying of Malfunction of Inverter Radiating Fin Temperature Rise
F17	P1	Frequency of retrying of Power Supply Voltage Imbalance
F21	E7	Frequency of retrying of Malfunction of Outdoor Unit Fan1 Motor
F22	H7	Frequency of retrying of Abnormal Outdoor Unit Fan1 Motor Signal
F24	E7	Frequency of retrying of Malfunction of Outdoor Unit Fan2 Motor
F25	H7	Frequency of retrying of Abnormal Outdoor Unit Fan2 Motor Signal

[Abnormal_code]

Mark on RAM Monitor	Meaning
Abnormal_code	It depends on the table below

Abnormal code on service manual	Display on Ram monitor screen
E0	30
E1	31
E2	32
E3	33
E4	34
E5	35
E7	37
E9	39
F3	53
H0	40

Abnormal code on service manual	Display on Ram monitor screen
H3	43
H7	47
H9	49
J2	62
J3	63
J5	65
J8	68
J9	69
JA	6A
JC	6C

Abnormal code on service manual	Display on Ram monitor screen
L1	71
L4	74
L5	75
L8	78
L9	79
LC	7C
P1	81
P4	84
PJ	8D
U1	91
U2	92

[State]

Mark on RAM Monitor	Meaning
State1	Normal when 5 or 9 is display
State2	Normal when 17 is display

Ignore the number since it is not clear which number will be displayed

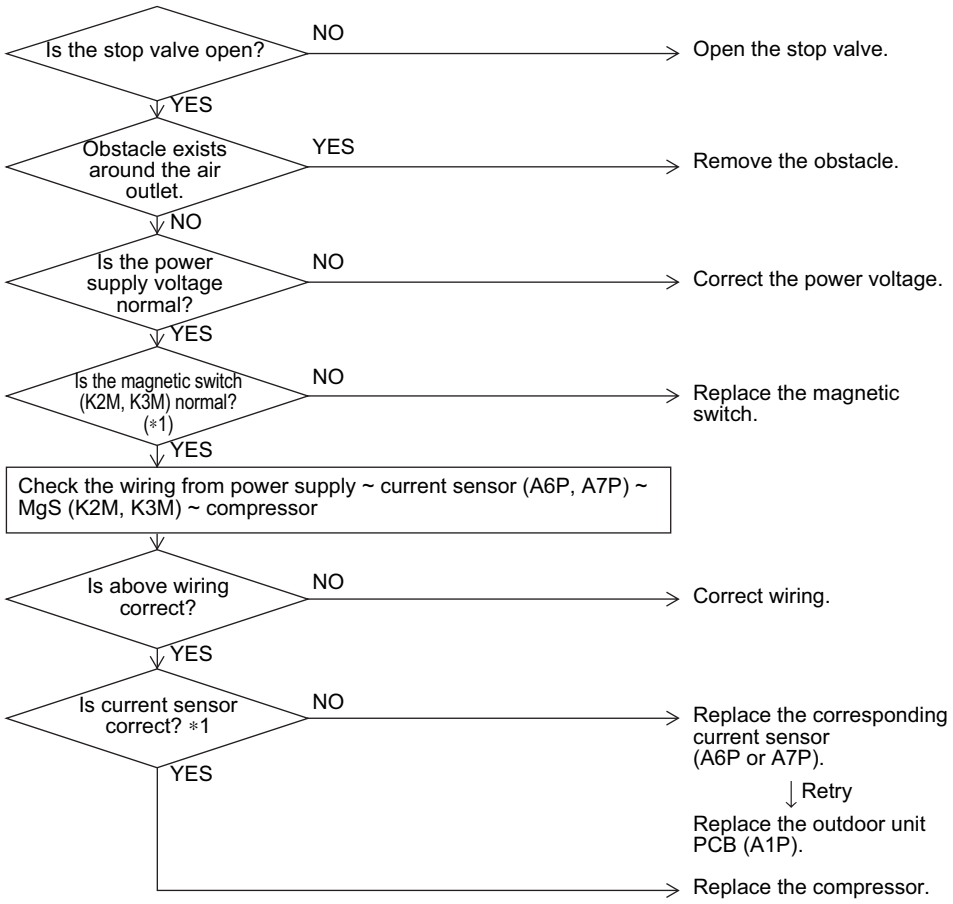
6.6 Flow Chart for Troubleshooting

6.6.1 "E0" STD Compressor Motor Overcurrent/Lock

Remote Controller Display	E0
Applicable Models	LRMEQ8~20AY1 LRLEQ8~20AY1
Method of Malfunction Detection	Detects the overcurrent with current sensor (CT).
Malfunction Decision Conditions	Malfunction is decided when the detected current value exceeds 14.95A for 2 seconds.
Supposed Causes	■ Closed stop value ■ Obstacles at the air outlet ■ Improper power voltage ■ Faulty magnetic switch ■ Faulty compressor ■ Faulty current sensor (A6P, A7P) ■ Defect of outdoor unit PCB (A1P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



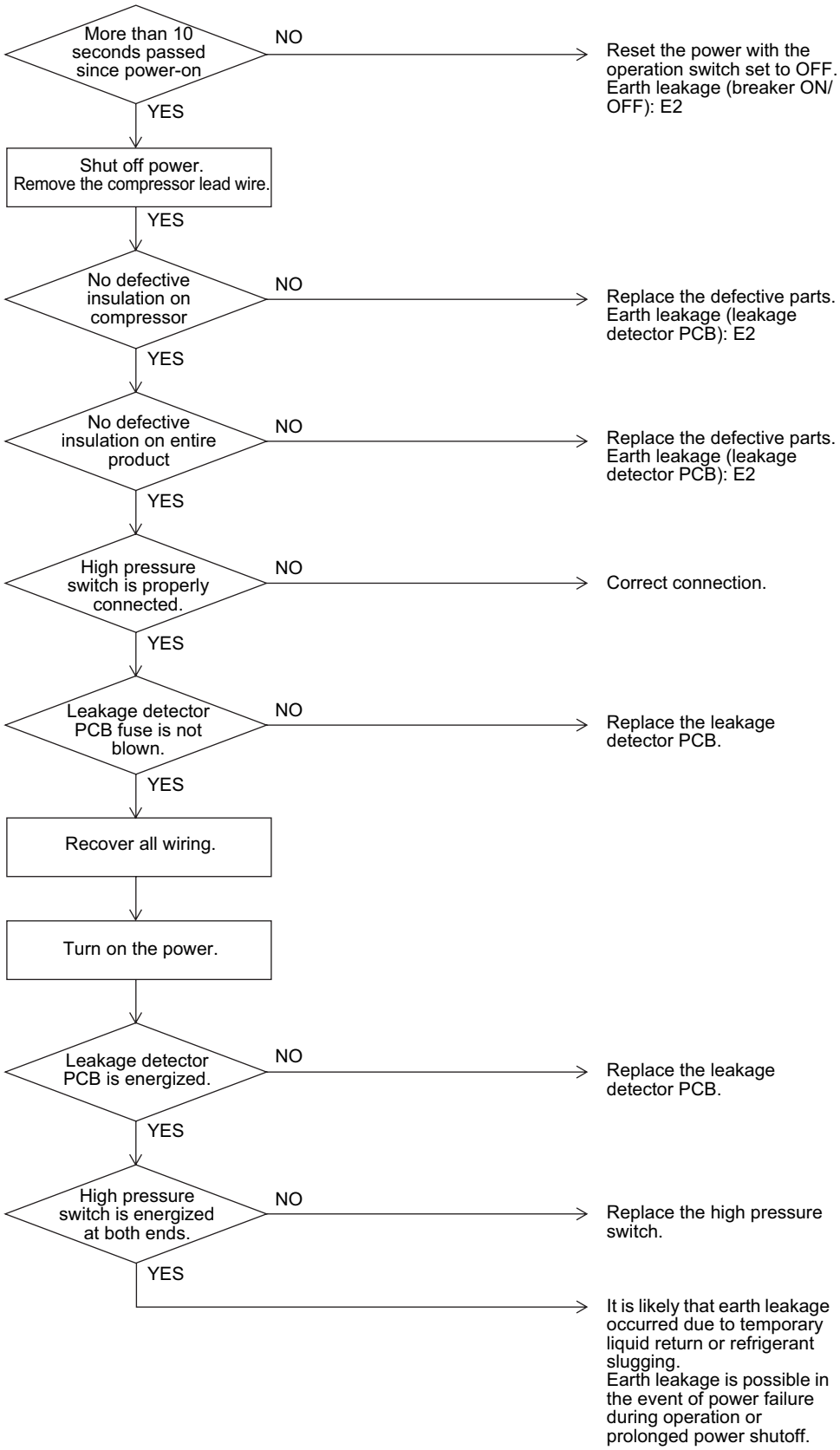
Note: ∗1 One of the possible factors may be chattering due to rough MgS contact.
∗2 Abnormal case
- The current sensor value is 0 during STD compressor operation.
- The current sensor value is more than 14.95A during STD compressor stop.

6.6.2 "E2" Earth Leakage

Remote Controller Display	E2
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	When there is a earth leakage (breaker ON/OFF) Time elapsed after power-on When there is a earth leakage (leakage detector PCB) The continuity of the high pressure switch is checked using the protective device circuit.
Malfunction Decision Conditions	When there is a earth leakage (breaker ON/OFF) Within 10 seconds after the power is turned on When there is a earth leakage (leakage detector PCB) If the high-pressure switch is activated but the pressure is not very high
Supposed Causes	■ Compressor (or the complete product) has defective insulation. ■ High pressure switch connection failure ■ Faulty leakage detector PCB ■ No continuity in high pressure switch ■ Temporary liquid return or refrigerant slugging ■ Power failure during operation ■ Prolonged power shut down ■ Within 10 seconds after the power is turned on

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



6.6.3 "E3" Actuation of High Pressure Switch

Remote Controller Display	E3
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	The protection device circuit checks continuity in the high pressure switch.
Malfunction Decision Conditions	Error is generated when the HPS activation count reaches the number specific to the operation mode. (Reference) Operating pressure of high pressure switch Operating pressure: 3.8MPa Reset pressure: 2.85MPa
Supposed Causes	■ Actuation of outdoor unit high pressure switch ■ Defect of high pressure switch ■ Defect of outdoor unit main PCB (A1P) ■ Instantaneous power failure ■ Faulty high pressure sensor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Check for the points shown below.
(1)Is the stop valve open?
(2)Is the HPS connector properly connected to the main PCB?
(3)Does the high pressure switch have continuity?

Are the three points above OK?
NO → Rectify the defective points, if any.
YES

(1)Mount a pressure gauge on the high pressure service port.
(2)Reset the operation with power breaker or operation switch and then restart the operation.

Does the stop due to malfunction (E3) recur?
YES → Is the HPS operating value normal (i.e., 3.8MPa)?
NO → Replace the HPS.
YES
NO

Are the characteristics of the high pressure sensor normal? (See ∗1.)
NO → Replace the high pressure sensor.
YES

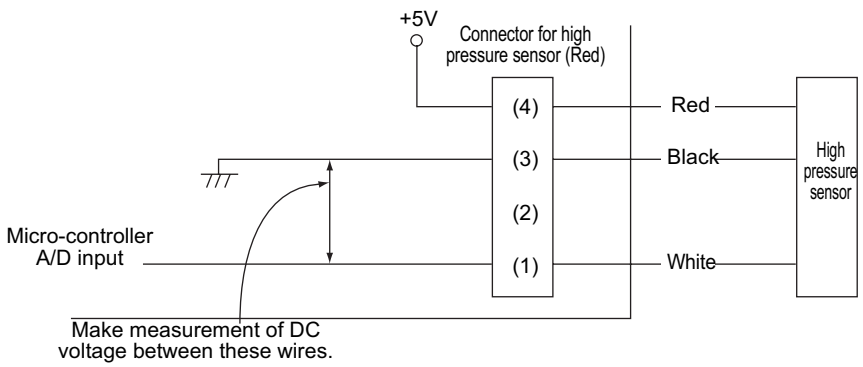
Service Checker
Connect the service checker to compare the “high pressure” value and the actual measurement value by pressure sensor (Refer to ∗1) by using the service checker.

Check if the “high pressure” value and the actual measurement value by pressure sensor are the same.
NO → Replace the main PCB (A1P).
YES

· The high pressure sensor is normal, and the pressure detected with the PCB is also normal.
· The high pressure has really become high.

CHECK 5 Referring to information on P134, remove the causes by which the high pressure has become high.

∗1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge.
∗2: Make measurement of voltage of the pressure sensor.

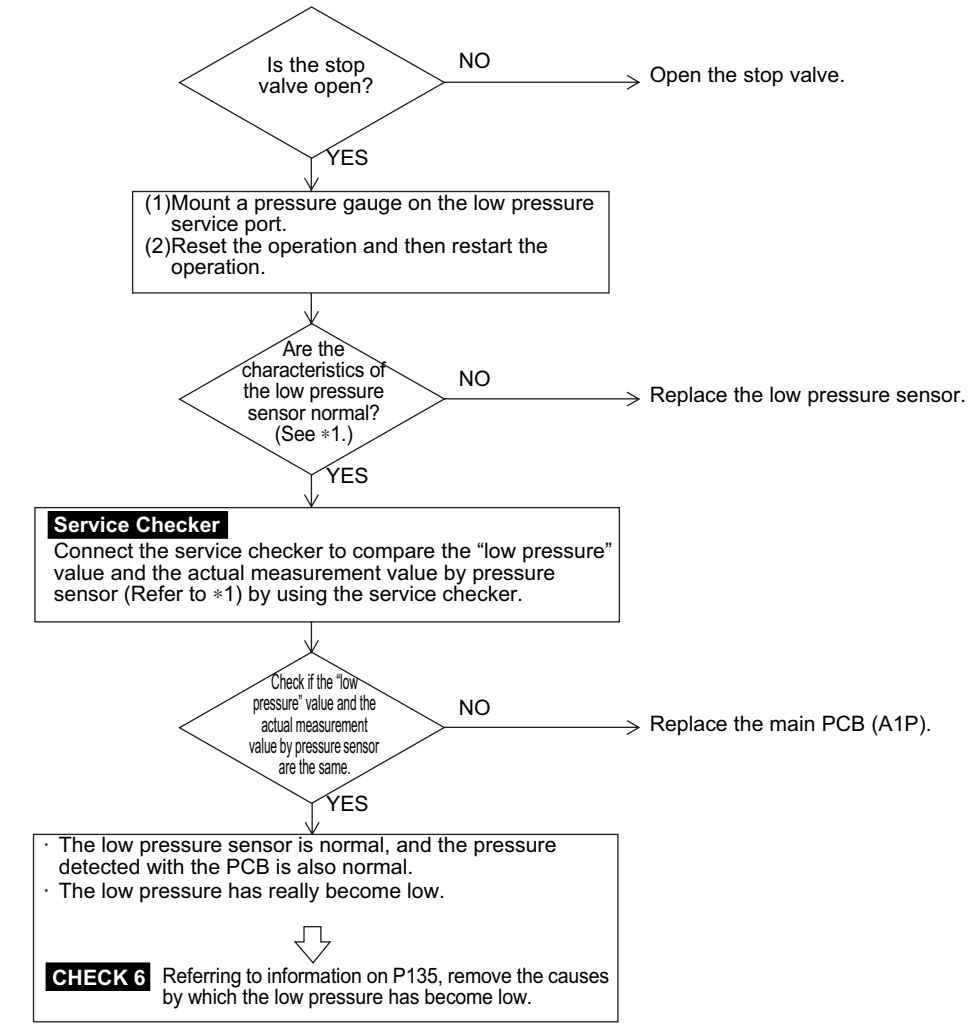


6.6.4 "E4" Actuation of Low Pressure Sensor

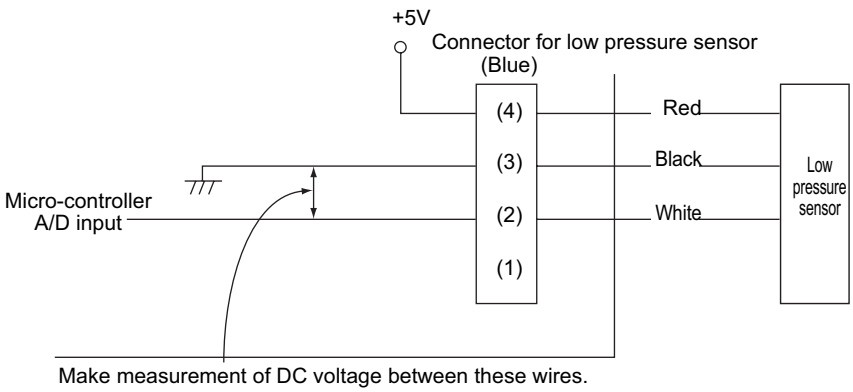
Remote Controller Display	E4
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	Abnormality is detected by the pressure value with the low pressure sensor.
Malfunction Decision Conditions	Error is generated when the low pressure is dropped under compressor operation. Low pressure <0.00MPa Detected within 3 hours after power-on
Supposed Causes	■ Abnormal drop of low pressure ■ Defect of low pressure sensor ■ Defect of outdoor unit PCB ■ Stop valve is not opened ■ Shortage of gas ■ Moisture choke

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge.
∗2: Make measurement of voltage of the pressure sensor.



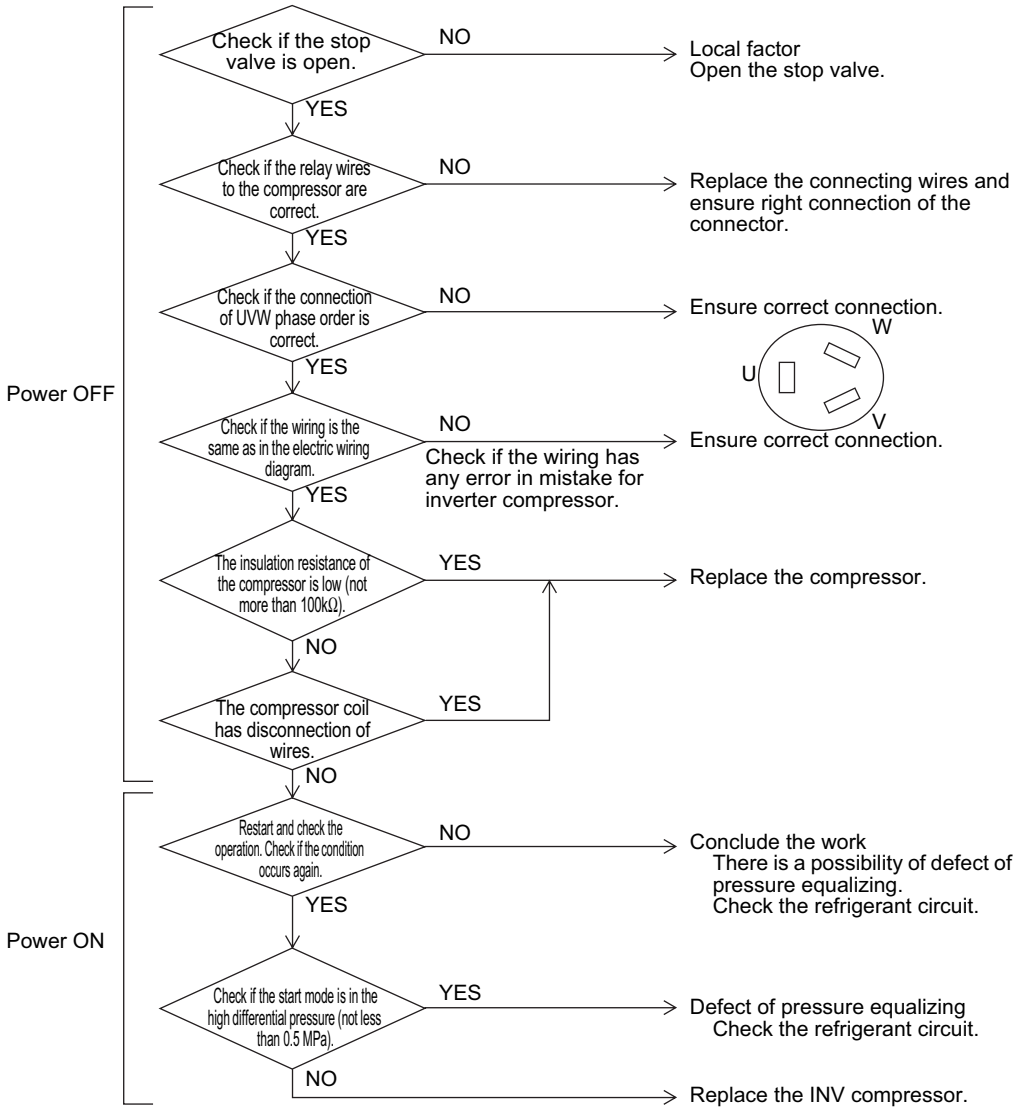
Checking for clog
To check for the presence of clog, measure the pipe temperatures at the locations before and after the check point.
(1) Electronic expansion valve (2) Secondary equipment filter (3) Dryer (4) Outdoor unit filter

6.6.5 "E5" Inverter Compressor Motor Lock

Remote Controller Display	E5
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	Inverter PCB takes the position signal from UVW line connected between the inverter and compressor, and the malfunction is detected when any abnormality is observed in the phase-current waveform.
Malfunction Decision Conditions	This malfunction will be output when the inverter compressor motor does not start up even in forced startup mode.
Supposed Causes	■ Inverter compressor lock ■ High differential pressure (0.5MPa or more) ■ Incorrect UVW wiring ■ Faulty inverter PCB ■ Stop valve is left in closed ■ Slugging state of refrigerant ■ Abrasion of sliding parts caused by wet operation due to faulty secondary equipment expansion valve ■ Failure of oil return due to faulty onsite piping work ■ Liquid return caused by operation signal connection failure

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Pressure difference between high pressure and low pressure before starting.

6.6.6 "E7" Malfunction of Outdoor Unit Fan Motor

Remote Controller Display

E7

Applicable Models

LRMEQ5~20AY1
LRLEQ5~20AY1

Method of Malfunction Detection

While the fan motor is in operation, detect the malfunction related to the fan motor according to revolutions detected with the hall sensor IC.

Malfunction Decision Conditions

- The fan revolutions are kept at less than a certain value for a period of not less than 6 seconds when the fan motor meets rotating conditions.
- The revolutions detection connector is disconnected.
- When the malfunction occurs 4 times, an alarm will be output. When it occurs 5 times, the system will go down.

Supposed Causes

- Failure of fan motor
- Defect or connection error of the connectors / harness between the fan motor and PCB
- The fan can not rotate due to any foreign substances entangled
- Clear condition: Continue normal operation for 10 minutes

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

LRL(M)EQ15A, 20AY1 have 2 fans.

Cut the power supply OFF and wait for 10 minutes.

Check if any foreign substances around the fan.
- YES → Remove the foreign substances.
- NO

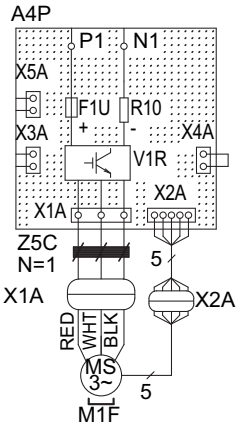
Check connectors for their connections
- For fan motor 1: Relay connectors X1A and X2A or connectors of compressor inverter PCB X1A and X2A
- For fan motor 2: Relay connectors X3A and X4A or connectors of fan inverter PCB X1A and X2A

Check if any connector is disconnected.
- YES → Insert the connector.
- NO

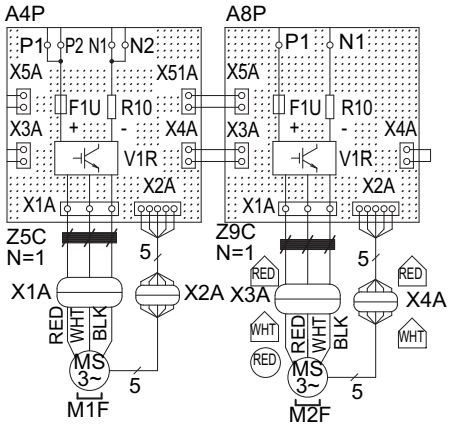
Check the relay connectors for their color
- For fan motor 1: White for all power supply and signal cables
- For fan motor 2: Red on the PCB side and white on the motor side for all power supply and signal cables

Relay connectors have any connection error.
- YES → Correct the connection of the relay connectors.
- NO → A

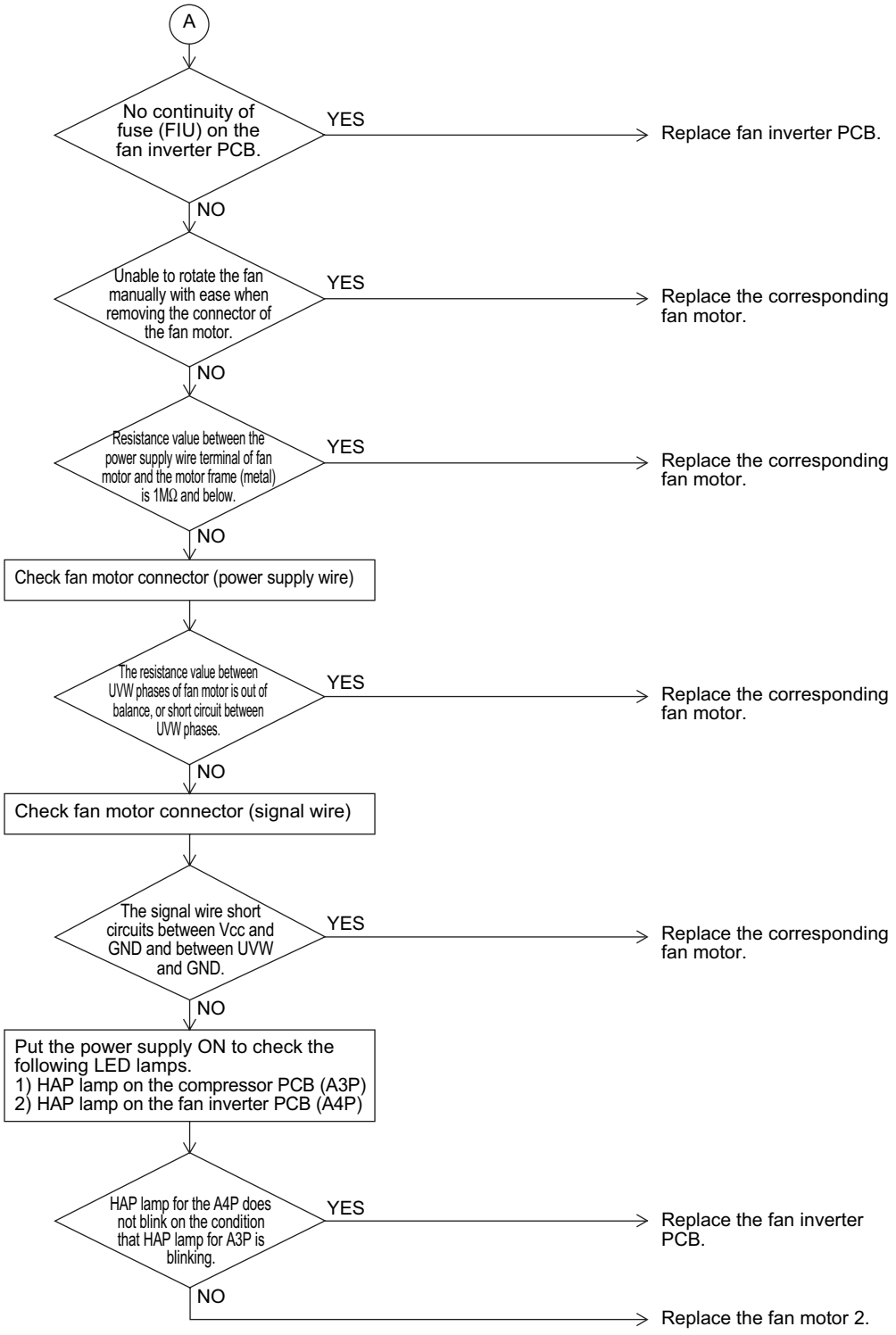
LRMEQ05~12AY1
LRLEQ05~12AY1



LRMEQ15, 20AY1
LRLEQ15, 20AY1



Troubleshooting

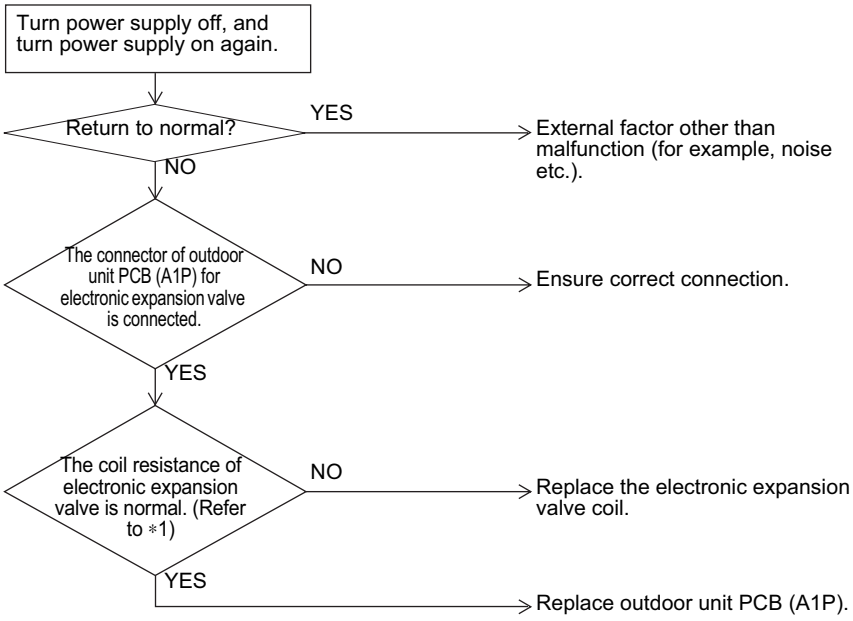


6.7 "E9" Malfunction of Electronic Expansion Valve Coil

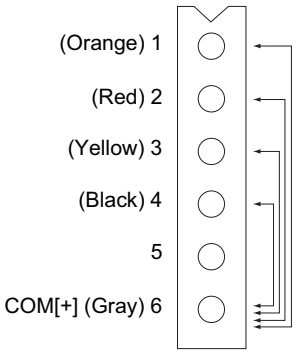
Remote Controller Display	E9
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	To be detected based on continuity existence of coil of electronic expansion valve (Y1E)
Malfunction Decision Conditions	No current is detected in the common (COM [+]) when power supply is ON.
Supposed Causes	■ Disconnection of connectors for electronic expansion valve (Y1E, Y2E, Y3E) ■ Defect of electronic expansion valve coil ■ Defect of outdoor unit main PCB (A1P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗ Make measurement of resistance between the connector pins, and then make sure the resistance falls in the range of 40 to 50Ω.



Measuring points	Judgment criteria
1 - 6	40~50Ω
2 - 6	
3 - 6	
4 - 6	

6.6.8 "F3" Abnormal Discharge Pipe Temperature

Remote Controller Display

F3

Applicable Models

LRMEQ5~20AY1
LRLEQ5~20AY1

Method of Malfunction Detection

Abnormality is detected according to the temperature detected by the discharge pipe temperature sensor.

Malfunction Decision Conditions

When the discharge pipe temperature rises to an abnormally high level.

or
- Discharge pipe temp. >120°C continuously for 70 sec. or more
- Discharge pipe temp. >125°C continuously for 30 sec. or more
- Discharge pipe temp. >130°C

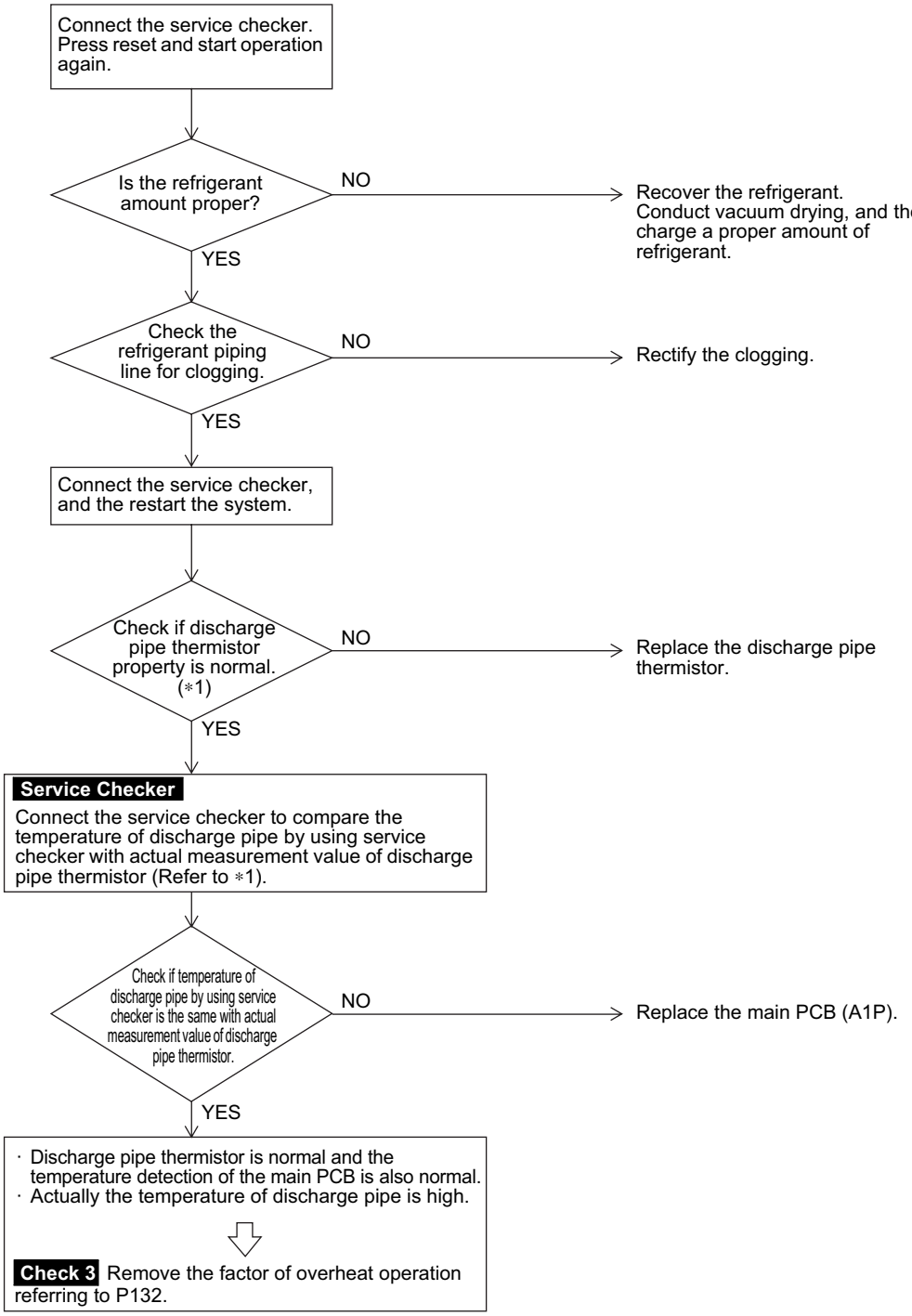
&
- Discharge pipe temp. >110°C
- EV2 · pls≥450 pls
- EV3 · pls≥450 pls
- continuously for 60 sec.

Supposed Causes

- Faulty discharge pipe temperature sensor
- Faulty discharge pipe temperature thermistor
- Faulty outdoor unit PCB
- Insufficient injection at intermediate heat exchanger outlet caused by flash gas due to gas leakage or insufficient volume of refrigerant.
- Clogging of electronic expansion valve for injection
- Failure to open the maintenance valve
- Insufficient insulation of onsite suction pipe

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Compare the resistance value of discharge pipe thermistor and the value based on the surface thermometer.
(Refer to P106 for the temperature and resistance characteristics of thermistor)

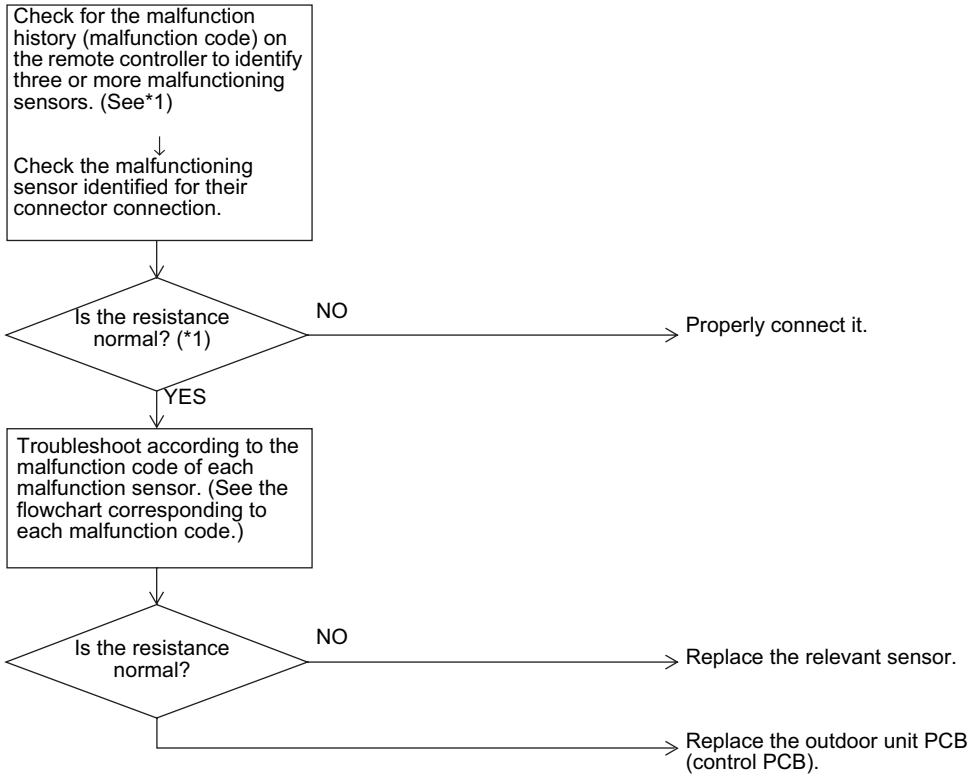
6.6.9 "H0" Three-sensor Malfunction

Remote Controller Display	H0
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	Malfunction is detected from the values detected by pressure sensors and temperature sensors (thermistors).
Malfunction Decision Conditions	Three or more out of the pressure sensors and the temperature sensors (thermistors) causes a "Sensor malfunction", respectively.
Supposed Causes	■ Faulty connection of sensor ■ Faulty outdoor unit PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

*Three or more sensors malfunction.



*1.List of relevant malfunction codes and connectors

Malfunction code	Relevant thermistor	LRMEQ5, 6AY1 LRLEQ5, 6AY1		LRMEQ8, 10, 12AY1 LRLEQ8, 10, 12AY1		LRMEQ15, 20AY1 LRLEQ15, 20AY1	
		Electrical symbol	Connector	Electrical symbol	Connector	Electrical symbol	Connector
89	Outdoor air thermistor	R1T	X18A	R1T	X18A	R1T	X18A
J3	Discharge pipe (M1C) thermistor	R31T	X29A	R31T	X29A	R31T	X29A
	Discharge pipe (M2C) thermistor	—	—	R32T		R32T	
	Discharge pipe (M3C) thermistor	—	—	—	—	R33T	
J5	Suction pipe thermistor	R2T	X30A	R2T	X30A	R2T	X30A
J8	Heat exchanger outlet thermistor	R5T		R5T		R5T	
J9	Heat exchanger inlet thermistor	R6T		R6T		R6T	
JA	High pressure sensor	S1NPH	X32A	S1NPH	X32A	S1NPH	X32A
JC	Low pressure sensor	S1NPL	X31A	S1NPL	X31A	S1NPL	X31A

6.6.10 "H3" Malfunction Related to High Pressure Switch

Remote Controller Display

H3

Applicable Models

LRMEQ5~20AY1
LRLEQ5~20AY1

Method of Malfunction Detection

Detect continuity in the high pressure switch in the protective device circuit.

Malfunction Decision Conditions

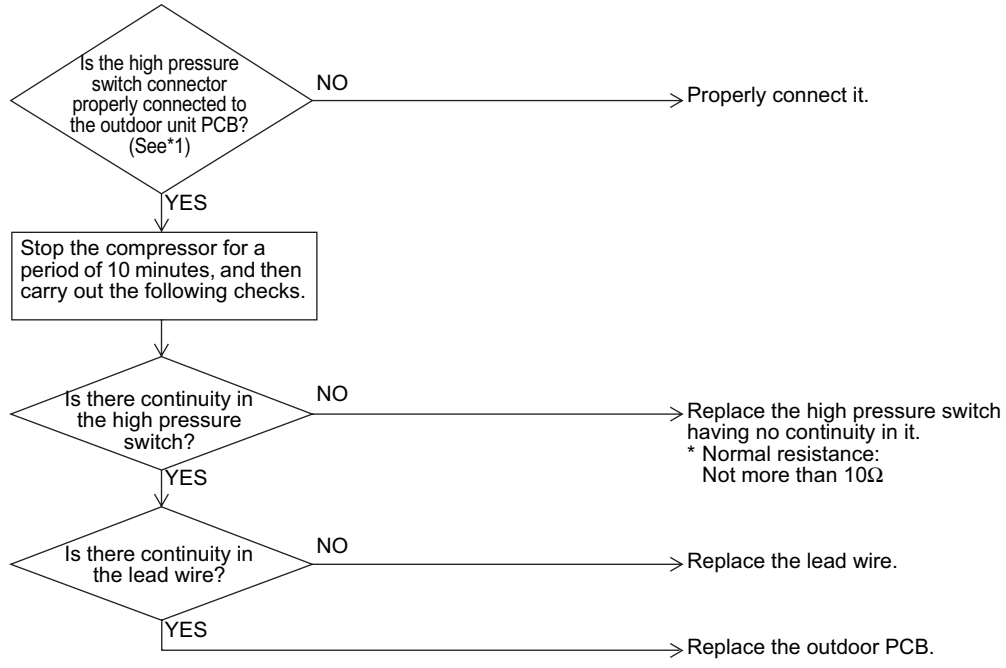
While the compressor stops running, there is no continuity in the high pressure switch.

Supposed Causes

- Faulty high pressure switch
- Broken wire in the harness of high pressure switch
- Faulty connection of the connector of high pressure switch
- Faulty outdoor unit PCB
- Broken wire in lead wire

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1 The table below shows the connector numbers of the high pressure switch.

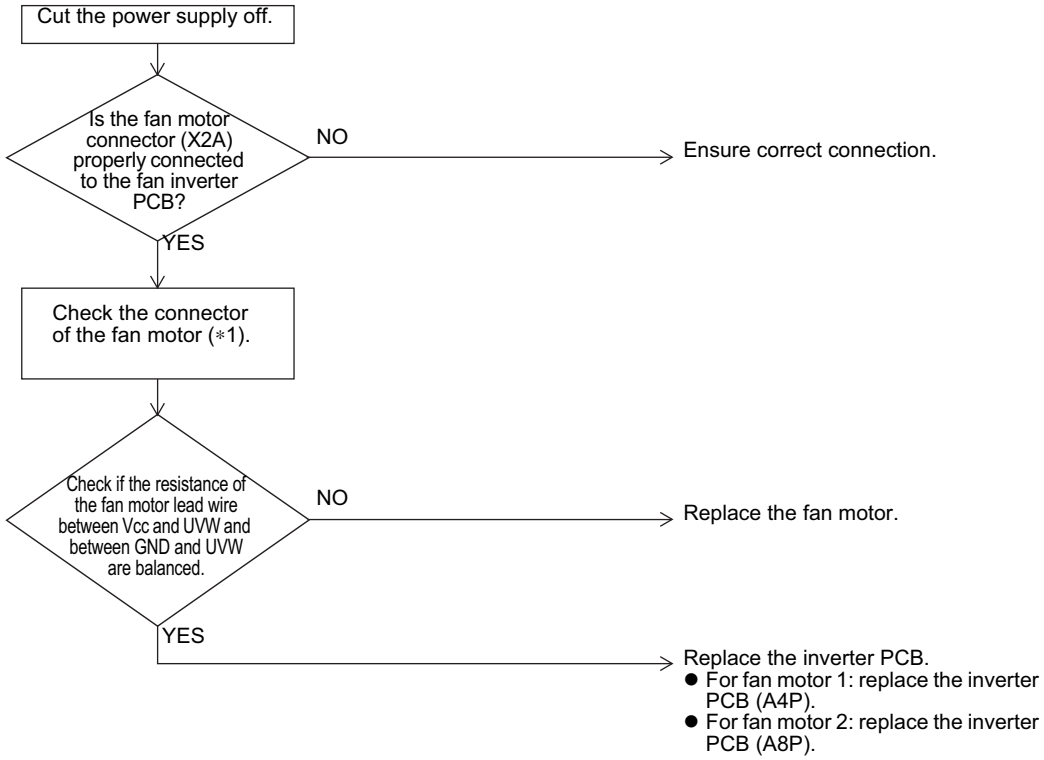
Model	Relevant PCB	Electric symbol	Connector No.
LRMEQ5, 6AY1 LRLEQ5, 6AY1	A1P	S1PH	X2A
LRMEQ8, 10, 12AY1 LRLEQ8, 10, 12AY1	A1P	S1PH S2PH	X2A X3A
LRMEQ15, 20AY1 LRLEQ15, 20AY1	A1P	S1PH S2PH S3PH	X2A X3A X4A

6.6.11 "A7" Abnormal Outdoor Fan Motor Signal

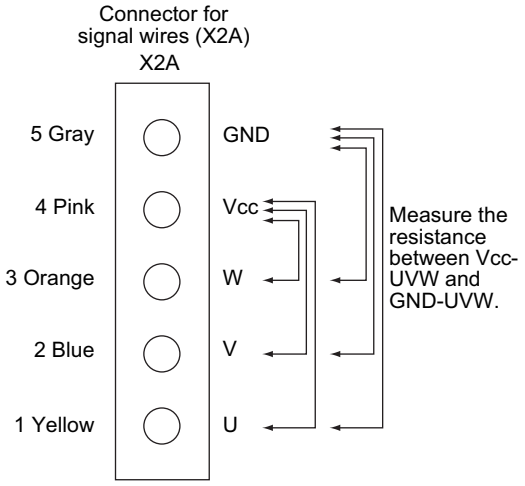
Remote Controller Display	A7
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	Detection of abnormal signal from fan motor.
Malfunction Decision Conditions	In case of detection of abnormal signal at starting fan motor.
Supposed Causes	■ Abnormal fan motor signal (circuit malfunction) ■ Broken, short or disconnection connector of fan motor connection cable ■ Fan Inverter PCB malfunction (A4P or A8P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1. Check procedure for fan motor connector
(1) Power OFF the fan motor.
(2) Remove the connector (X2A) on the PCB to measure the following resistance value.
Judgement criteria: resistance value between each phase is within ±20%



6.6.12 "H9" Malfunction of Outdoor Air Thermistor

Remote Controller Display

H9

Applicable Models

LRMEQ5~20AY1
LRLEQ5~20AY1

Method of Malfunction Detection

Malfunction is detected from the temperatures detected by the outdoor air thermistor.

Malfunction Decision Conditions

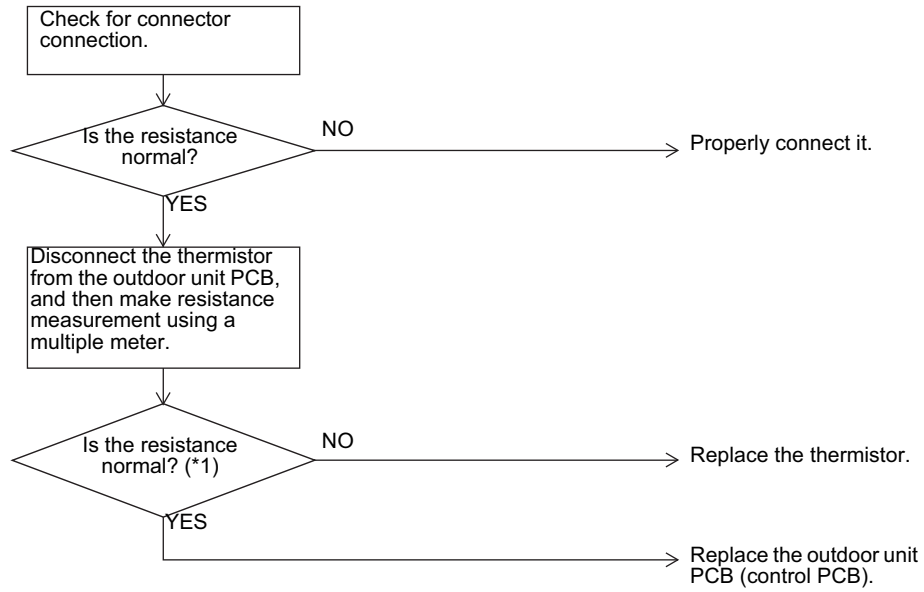
While in operation, the thermistor causes a broken wire or a short circuit in it.

Supposed Causes

- Faulty thermistor
- Faulty connection of connector
- Faulty outdoor unit PCB (control PCB)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1. For "temperature and resistance characteristics of thermistor", refer to the table shown below.

Temp.(°C)	Resistance (kΩ)	Temp.(°C)	Resistance (kΩ)
0	65.8	30	16.1
2	59.4	32	14.8
4	53.7	34	13.6
6	48.6	36	12.5
8	44.0	38	11.5
10	40.0	40	10.6
12	36.3	42	9.8
14	33.0	44	9.1
16	30.1	46	8.4
18	27.4	48	7.7
20	25.0	50	7.2
22	22.9	52	6.7
24	20.9	54	6.2
26	19.1	56	5.7
28	17.5	58	5.3

6.6.13 "J2" Current Sensor Malfunction

Remote Controller Display

J2

Applicable Models

LRMEQ5~20AY1
LRLEQ5~20AY1

Method of Malfunction Detection

Malfunction is detected from the current value detected by current sensor.

Malfunction Decision Conditions

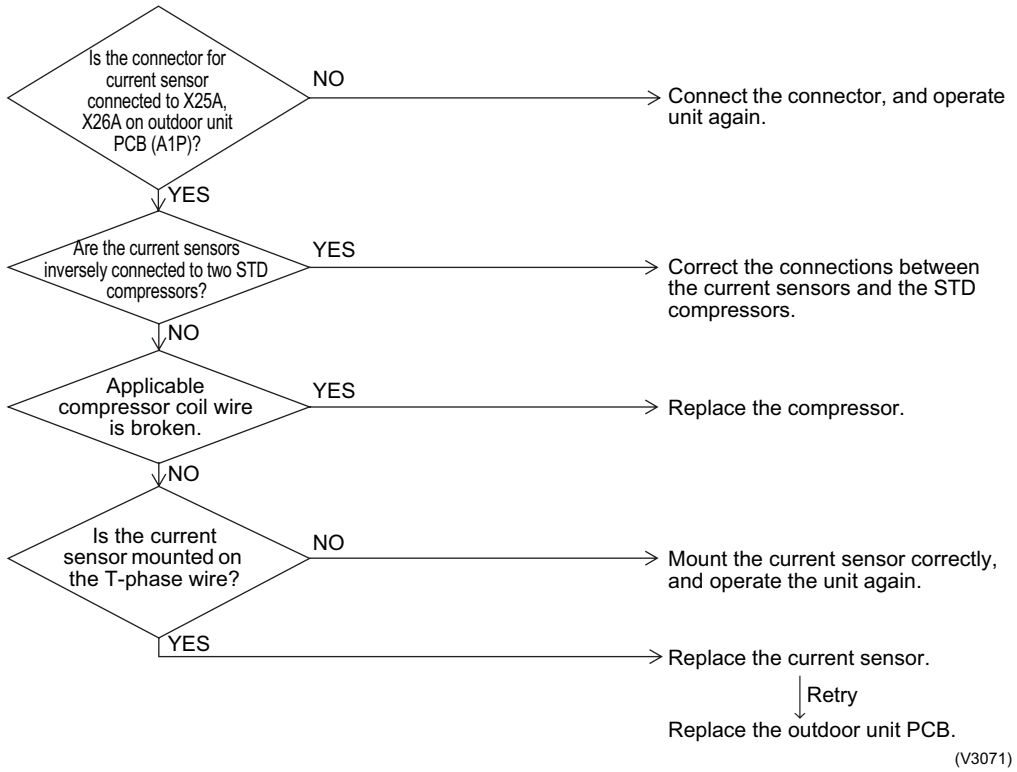
When the current value detected by current sensor becomes 5A or lower, or 40A or more during STD compressor operation.

Supposed Causes

- Faulty current sensor
- Faulty outdoor unit PCB
- Defective compressor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

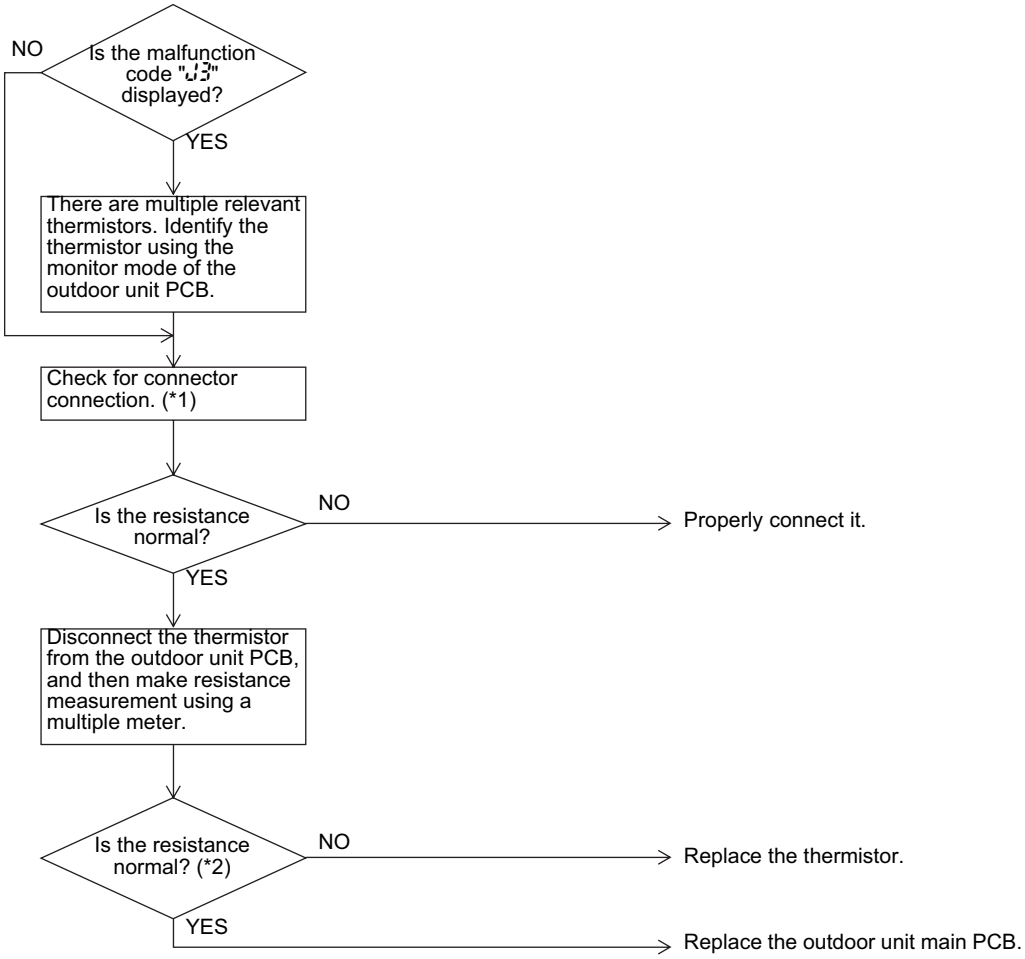


6.6.14 "J3,J5,J8,J9" Faulty Thermistor

Remote Controller Display	J3,J5,J8,J9
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	Malfunction is detected from the temperatures detected by thermistors.
Malfunction Decision Conditions	While in operation, any of the thermistors causes a broken wire or a short circuit in it.
Supposed Causes	■ Faulty connection of thermistor ■ Faulty thermistor ■ Faulty outdoor unit PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1. List of malfunction codes, description of malfunction, and electric symbols

Malfunction code	Relevant thermistor	LRMEQ5, 6AY1 LRLEQ5, 6AY1		LRMEQ8, 10, 12AY1 LRLEQ8, 10, 12AY1		LRMEQ15, 20AY1 LRLEQ15, 20AY1	
		Electrical symbol	Connector	Electrical symbol	Connector	Electrical symbol	Connector
H9	Outdoor air thermistor	R1T	X18A	R1T	X18A	R1T	X18A
J3	Discharge pipe (M1C) thermistor	R31T	X29A	R31T	X29A	R31T	X29A
	Discharge pipe (M2C) thermistor	—	—	R32T		R32T	
	Discharge pipe (M3C) thermistor	—	—	—	—	R33T	
J5	Suction pipe thermistor	R2T	X30A	R2T	X30A	R2T	X30A
J8	Heat exchanger outlet thermistor	R5T		R5T		R5T	
J9	Heat exchanger inlet thermistor	R6T		R6T		R6T	
JA	High pressure sensor	S1NPH	X32A	S1NPH	X32A	S1NPH	X32A
JC	Low pressure sensor	S1NPL	X31A	S1NPL	X31A	S1NPL	X31A

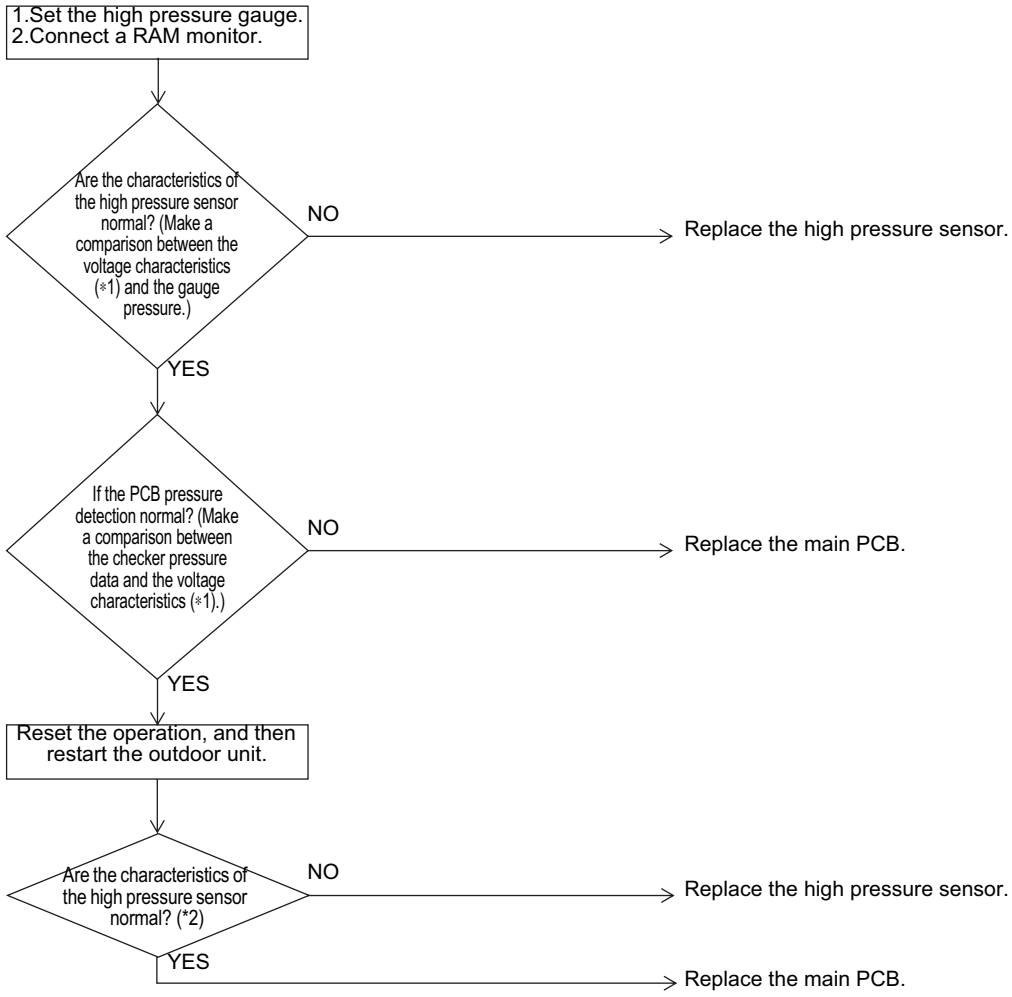
*2. For "temperature and resistance characteristics of thermistor", refer to information on P.138.

6.6.15 "JA" Malfunction of High Pressure Sensor

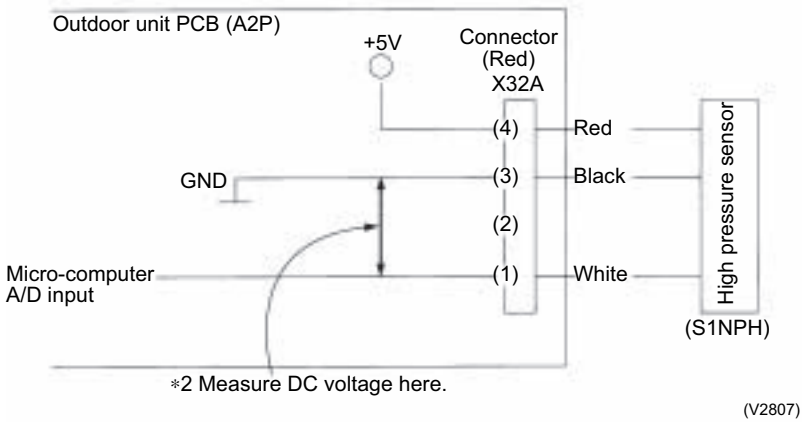
Remote Controller Display	JA
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	Malfunction is detected from the pressure detected by the high pressure sensor.
Malfunction Decision Conditions	When the high pressure sensor is short circuit or open circuit. (Not less than 4.3MPa, or 0.01MPa and below)
Supposed Causes	■ Defect of high pressure sensor ■ Connection of low pressure sensor with wrong connection ■ Defect of outdoor unit PCB ■ Defective connection of high pressure sensor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Voltage measurement point



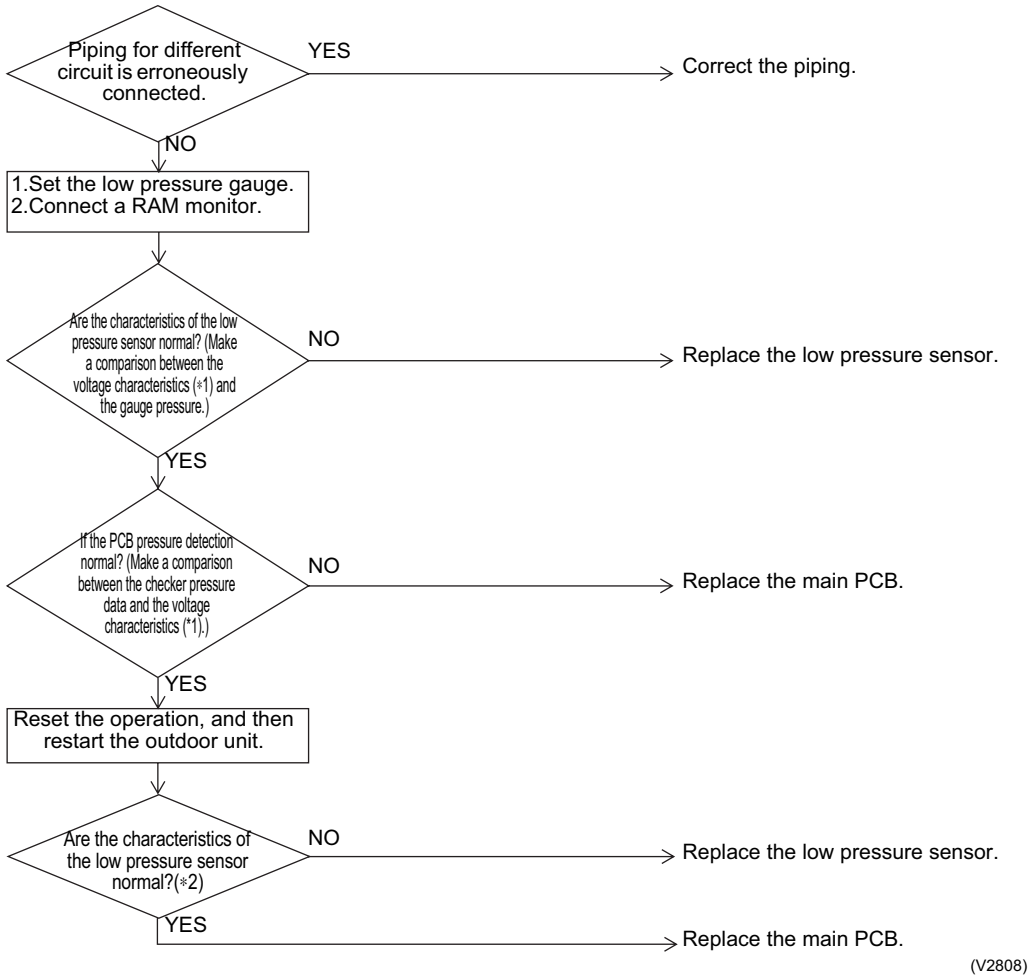
∗2: Refer to “Voltage Characteristics of Pressure Sensor” table on P.139.

6.6.16 “UC” Malfunction of Low Pressure Sensor

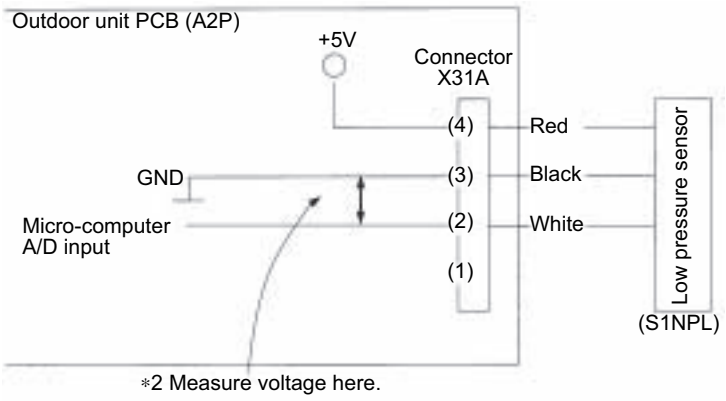
Remote Controller Display	UC
Applicable Models	LRMEQ5~20PY1 LRLEQ5~20PY1
Method of Malfunction Detection	Malfunction is detected from pressure detected by low pressure sensor.
Malfunction Decision Conditions	When the low pressure sensor is short circuit or open circuit. (Not less than 1.8MPa, or -0.1MPa and below)
Supposed Causes	■ Defect of low pressure sensor ■ Connection of high pressure sensor with wrong connection ■ Defect of outdoor unit PCB ■ Defective connection of low pressure sensor ■ Piping with wrong connection ■ Reduction of low pressure when the thermistors (Ti, Tg) are defective.

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Voltage measurement point



∗2: Refer to “Voltage Characteristics of Pressure Sensor” table on P.139.

6.6.17 "L 1" Faulty Inverter PCB

Remote Controller Display

L 1

Applicable Models

LRMEQ5~20AY1
LRLEQ5~20AY1

Method of Malfunction Detection

- Malfunction is detected from the current values while waveform is outputted prior to the startup of compressor.
- Malfunction is detected from the values detected by the current sensor in synchronized operation at startup.

Malfunction Decision Conditions

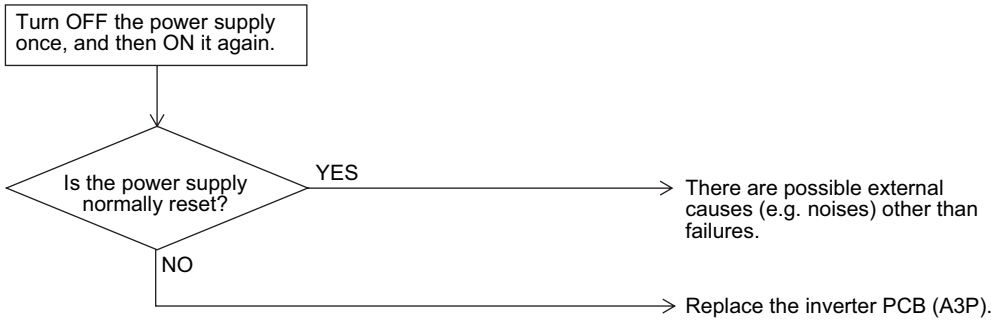
- An overcurrent (OCP) flows while waveform is outputted.
- The current sensor malfunctions while in synchronized operation.
- IGBT malfunctions.

Supposed Causes

- Faulty inverter PCB (A3P)
  - Faulty IPM
  - Faulty current sensor
  - Faulty IGBT or drive circuit

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



6.6.18 "L4" Malfunction of Inverter Radiating Fin Temperature Rise

Remote Controller Display

L4

Applicable Models

LRMEQ5~20AY1
LRLEQ5~20AY1

Method of Malfunction Detection

Fin temperature is detected by the thermistor of the radiation fin.

Malfunction Decision Conditions

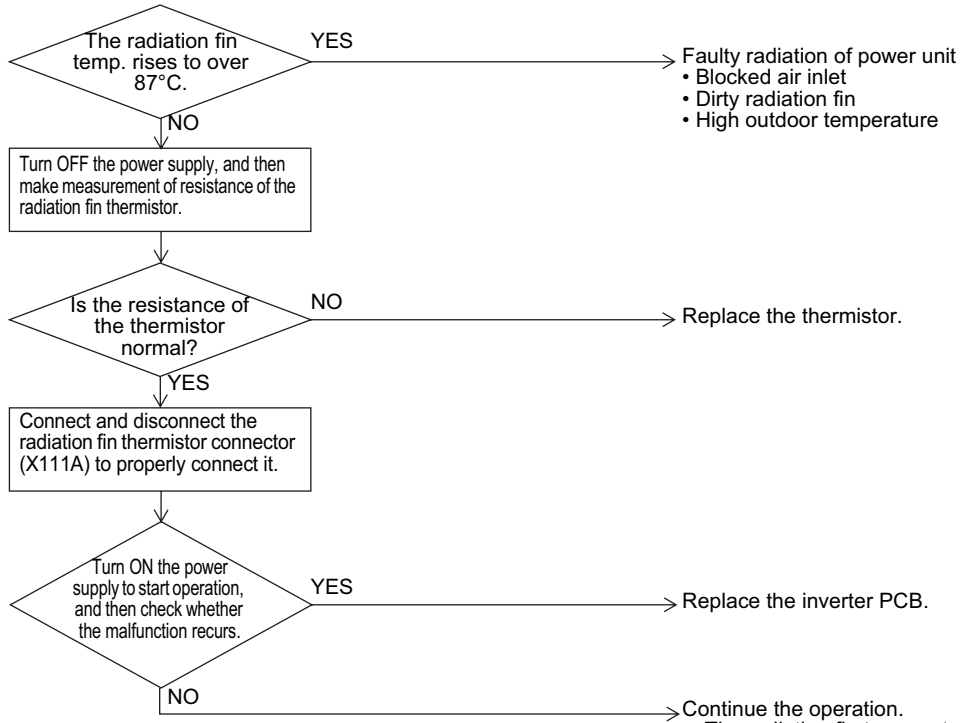
When the temperature of the inverter radiation fin increases above 93°C.

Supposed Causes

- Actuation of fin thermal (Actuates above 93°C)
- Faulty inverter PCB
- Faulty radiating fin thermistor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



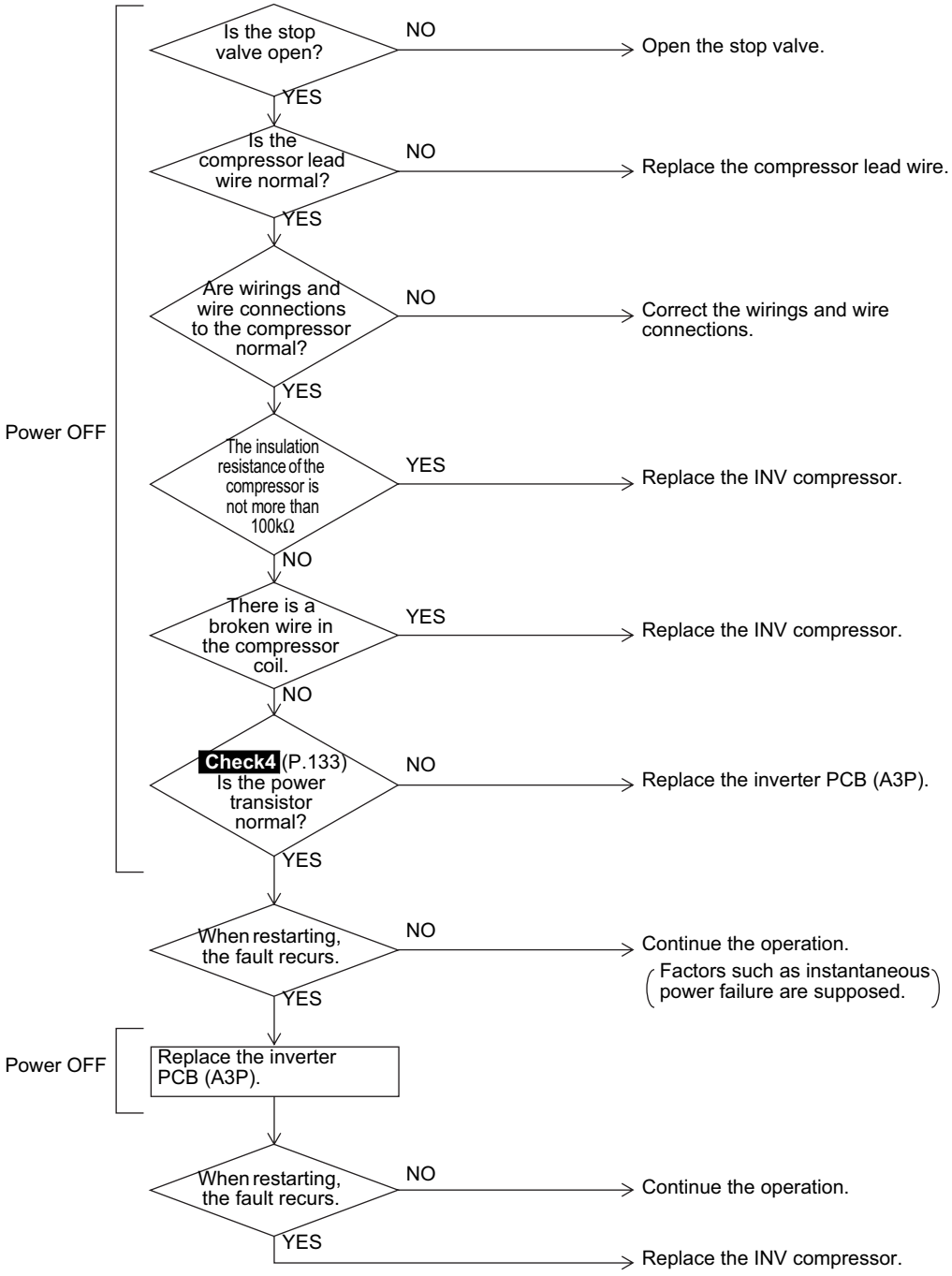
(Reference) Reset temperatures
- LRMEQ5~20AY1, LRLEQ5~20AY1
  Not more than 79°C for a period of one minute

6.6.19 "L5" INV Compressor Instantaneous Overcurrent

Remote Controller Display	L5
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	Malfunction is detected from the currents flowing in the power transistor.
Malfunction Decision Conditions	An overcurrent (59.1A) flows even instantaneously.
Supposed Causes	■ Faulty compressor coil (e.g. broken wire or insulation failure) ■ Compressor startup failure (mechanical lock) ■ Faulty inverter PCB ■ Slugging of refrigerant ■ Abrasion of sliding parts caused by wet operation due to faulty secondary equipment expansion valve ■ Failure of oil return due to faulty on site piping work ■ Liquid return caused by operation signal connection failure

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

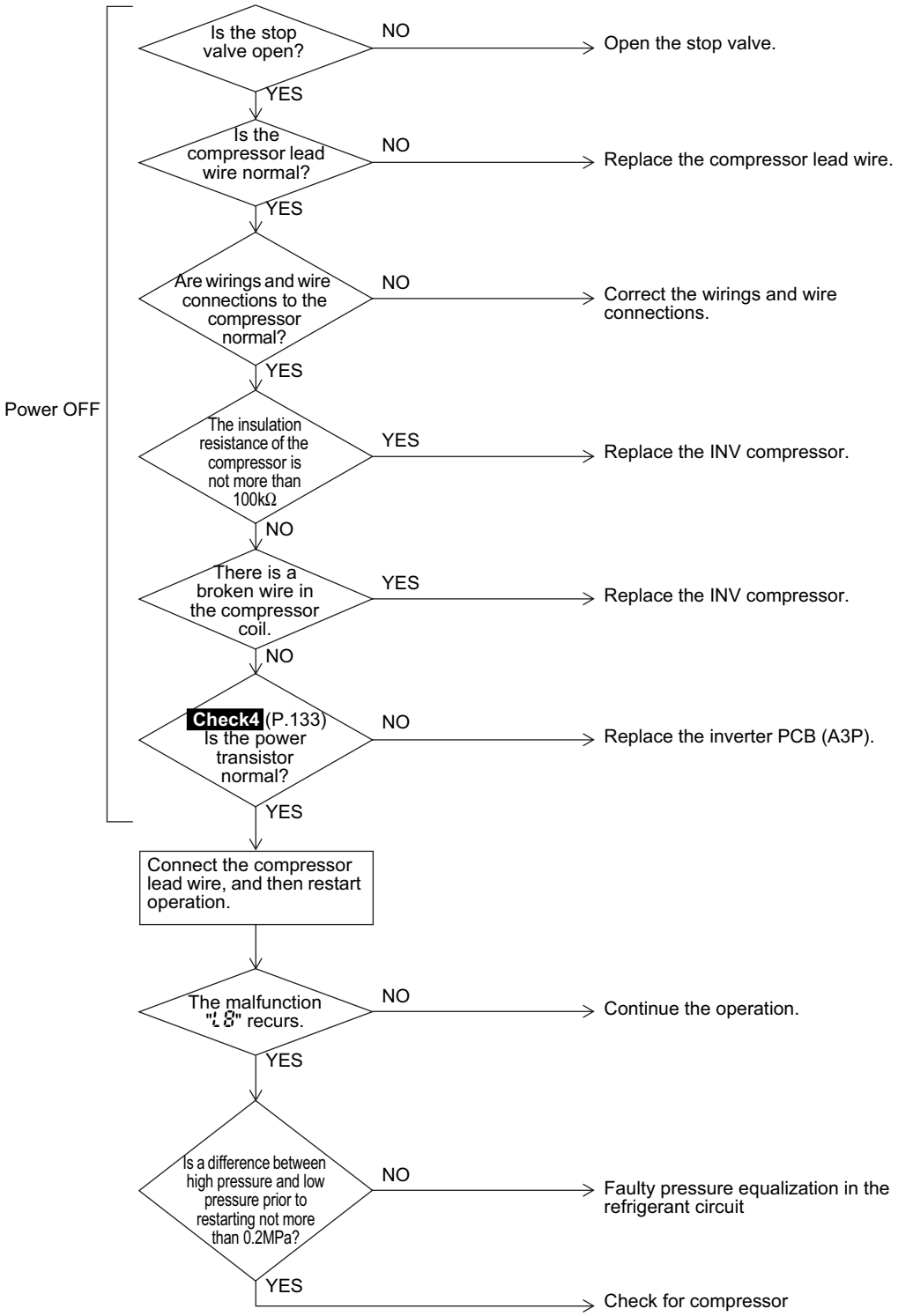


6.6.20 "L8" INV Compressor Overload

Remote Controller Display	L8
Applicable Models	LRMEQ5~20AY1 LRLEQ5~20AY1
Method of Malfunction Detection	Malfunction is detected from the currents flowing in the power transistor.
Malfunction Decision Conditions	Currents on the secondary side of the inverter come to the following values. (1) Not less than 19A for a period of consecutive 5 seconds (2) Not less than 16.1A for a period of consecutive 260 seconds
Supposed Causes	■ Compressor overload ■ Broken wire in compressor coil ■ Disconnection of compressor wiring ■ Faulty inverter PCB ■ Slugging of refrigerant ■ Abrasion of sliding parts caused by wet operation due to faulty secondary equipment expansion valve ■ Failure of oil return due to faulty on site piping work ■ Liquid return caused by operation signal connection failure

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



6.6.21 "L9" Faulty INV Compressor Startup

Remote Controller Display

L9

Applicable Models

LRMEQ5~20AY1
LRLEQ5~20AY1

Method of Malfunction Detection

Malfunction is detected from the signal waveforms of the compressor.

Malfunction Decision Conditions

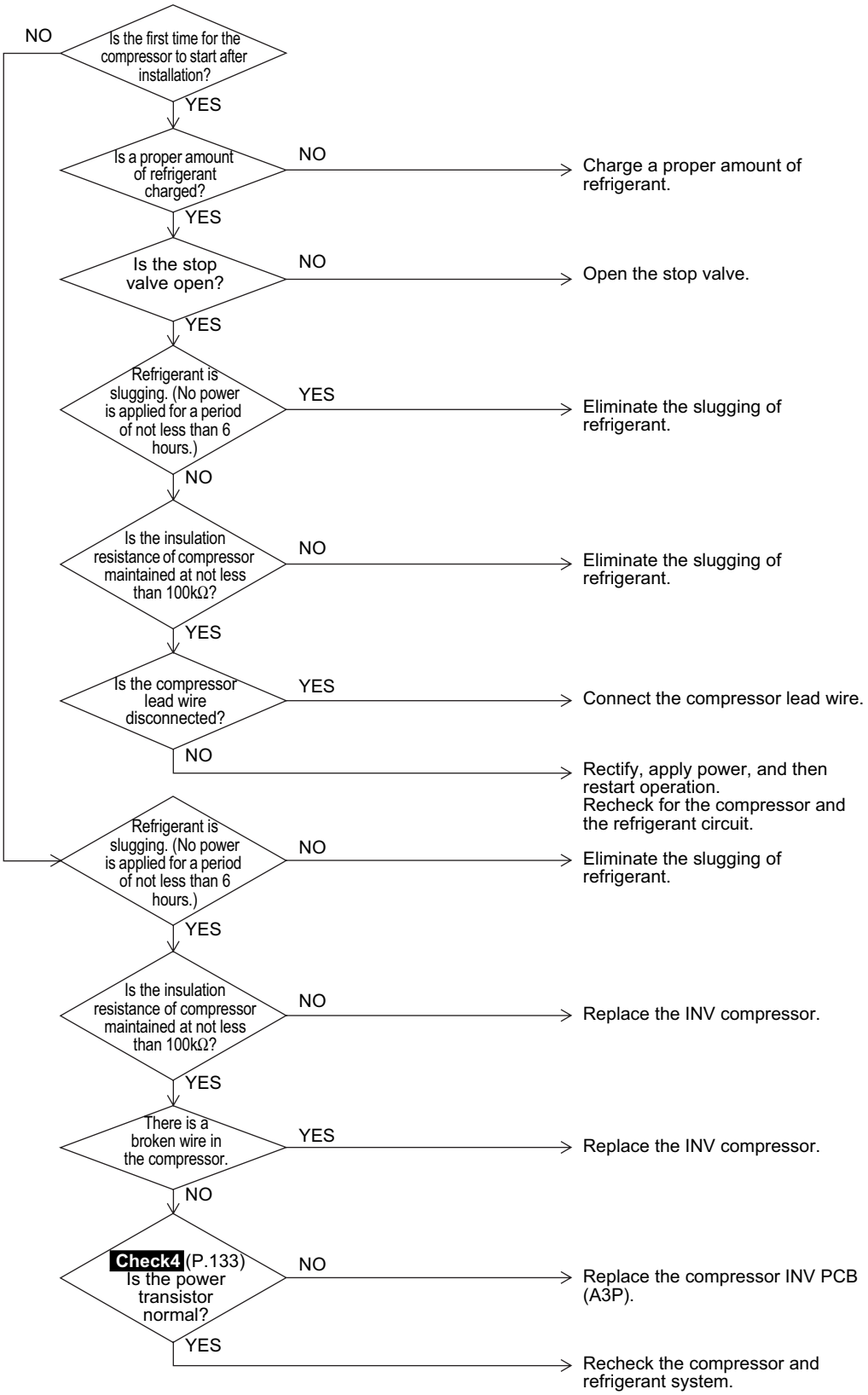
The compressor startup sequence is not complete.

Supposed Causes

- Failure to open the stop valve
- Faulty compressor
- Erroneous wire connections to compressor
- Large differential pressure prior to compressor startup
- Faulty inverter PCB
- Slugging of refrigerant
- Abrasion of sliding parts caused by wet operation due to faulty secondary equipment expansion valve
- Failure of oil return due to faulty onsite piping work
- Liquid return caused by operation signal connection failure
- Too frequent on/off operation due to insufficient loading

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

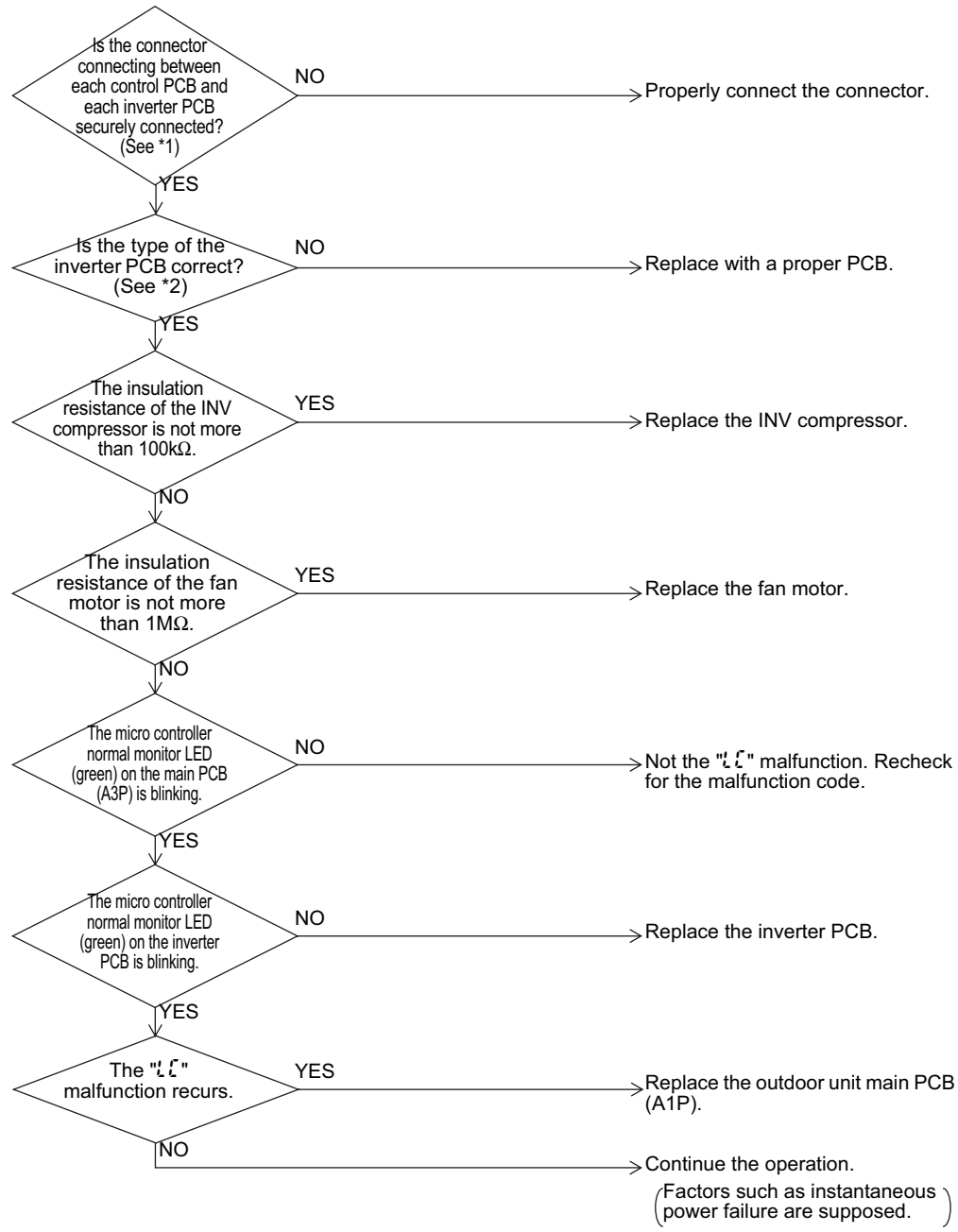


6.6.22 "LC" Malfunction of Transmission (between Inverter PCB and Main PCB)

Remote Controller Display	LC
Applicable Models	LRMEQ5~20PY1 LRLEQ5~20PY1
Method of Malfunction Detection	Check the communication state between the inverter PCB and the control PCB by micro-computer.
Malfunction Decision Conditions	When the correct communication is not conducted in certain period.
Supposed Causes	■ Faulty connection between the inverter PCB and the main PCB ■ Faulty main PCB (transmission part) ■ Faulty inverter PCB ■ Faulty noise filter ■ External factors (e.g. noises) ■ Faulty INV compressor ■ Faulty fan motor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1. Connect and disconnect the connector to make sure it is securely connected.
*2. List of types of inverter PCB

Applicable model	Type
LRMEQ5~20AY1 LRLEQ5~20AY1	PC0509-2(A)

6.6.23 "P1" Power Supply Voltage Imbalance

Remote Controller Display

P1

Applicable Models

LRMEQ5~20PY1
LRLEQ5~20PY1

Method of Malfunction Detection

Malfunction is detected from the voltage imbalance from the PCB.

Malfunction Decision Conditions

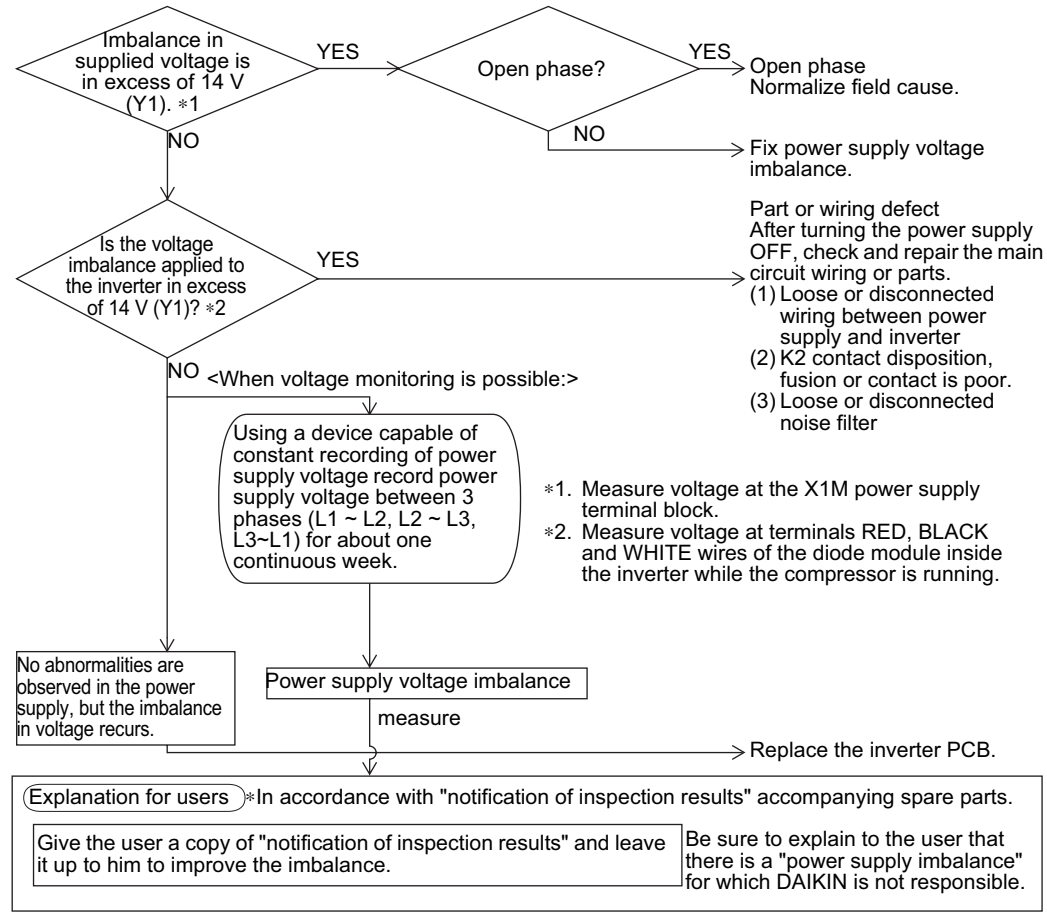
The power supply voltage causes an imbalance of not less than approx.14V?
Continue operation without deciding the malfunction.

Supposed Causes

- Open phase
- Voltage imbalance between phases
- Faulty main circuit capacitor
- Faulty inverter PCB
- Faulty K2M
- Faulty main circuit wiring

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



6.6.24 "P4" Faulty Radiation Fin Thermistor

Remote Controller Display

P4

Applicable Models

LRMEQ5~20PY1
LRLEQ5~20PY1

Method of Malfunction Detection

While the compressor stops running, detect the resistance of the radiation fin thermistor.

Malfunction Decision Conditions

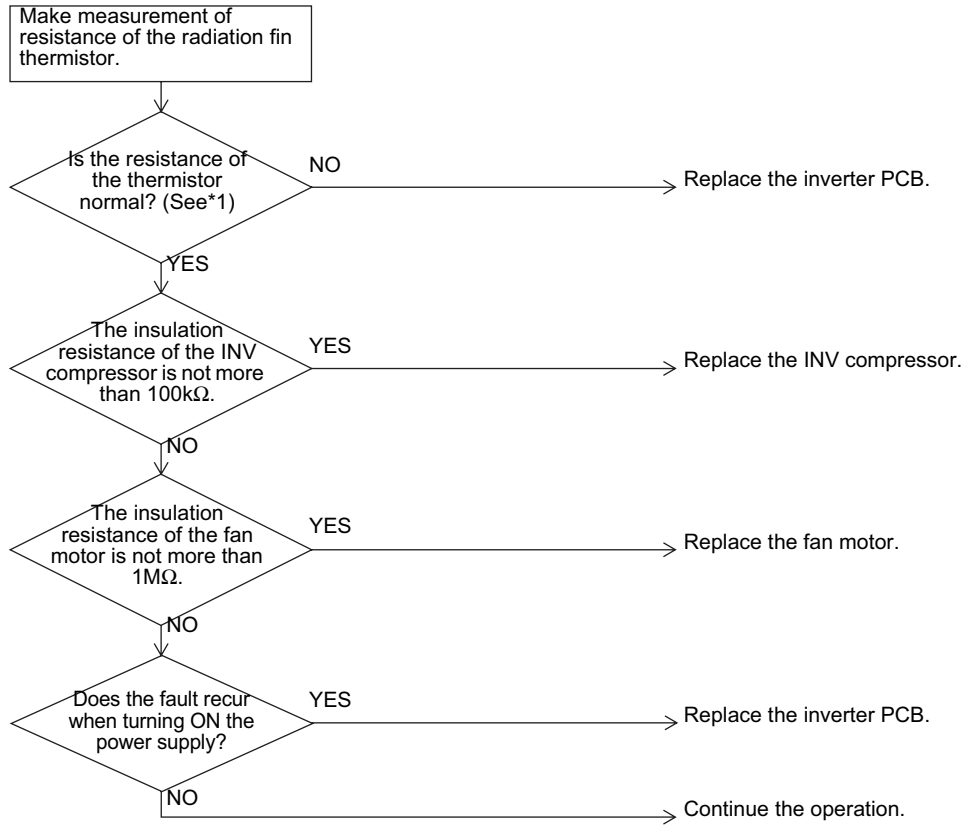
The thermistor resistance comes to a value equivalent to an open or a short circuit.

Supposed Causes

- Faulty radiation fin thermistor
- Faulty inverter PCB
- Faulty INV compressor
- Faulty fan motor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1. Refer to the characteristics of radiation fin thermistor (P.106).

6.6.25 "U1" Reverse Phase / Open Phase

Remote Controller Display

U1

Applicable Models

LRMEQ5~20PY1
LRLEQ5~20PY1

Method of Malfunction Detection

Make judgement by detecting the state of every phase in the reverse phase detection circuit.

Malfunction Decision Conditions

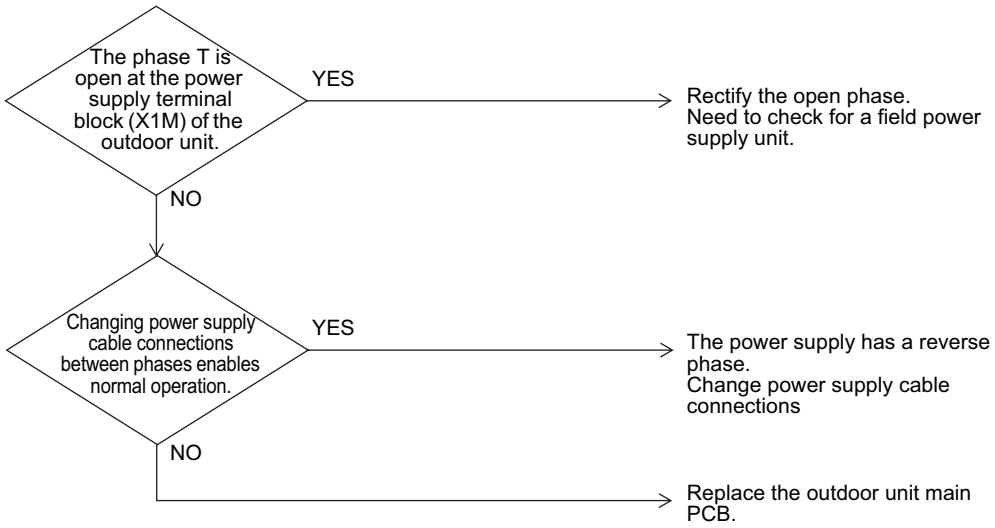
The power supply voltage has a reverse phase or the phase T is open.

Supposed Causes

- Reverse phase of power supply
- Open phase T of power supply
- Faulty outdoor unit PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

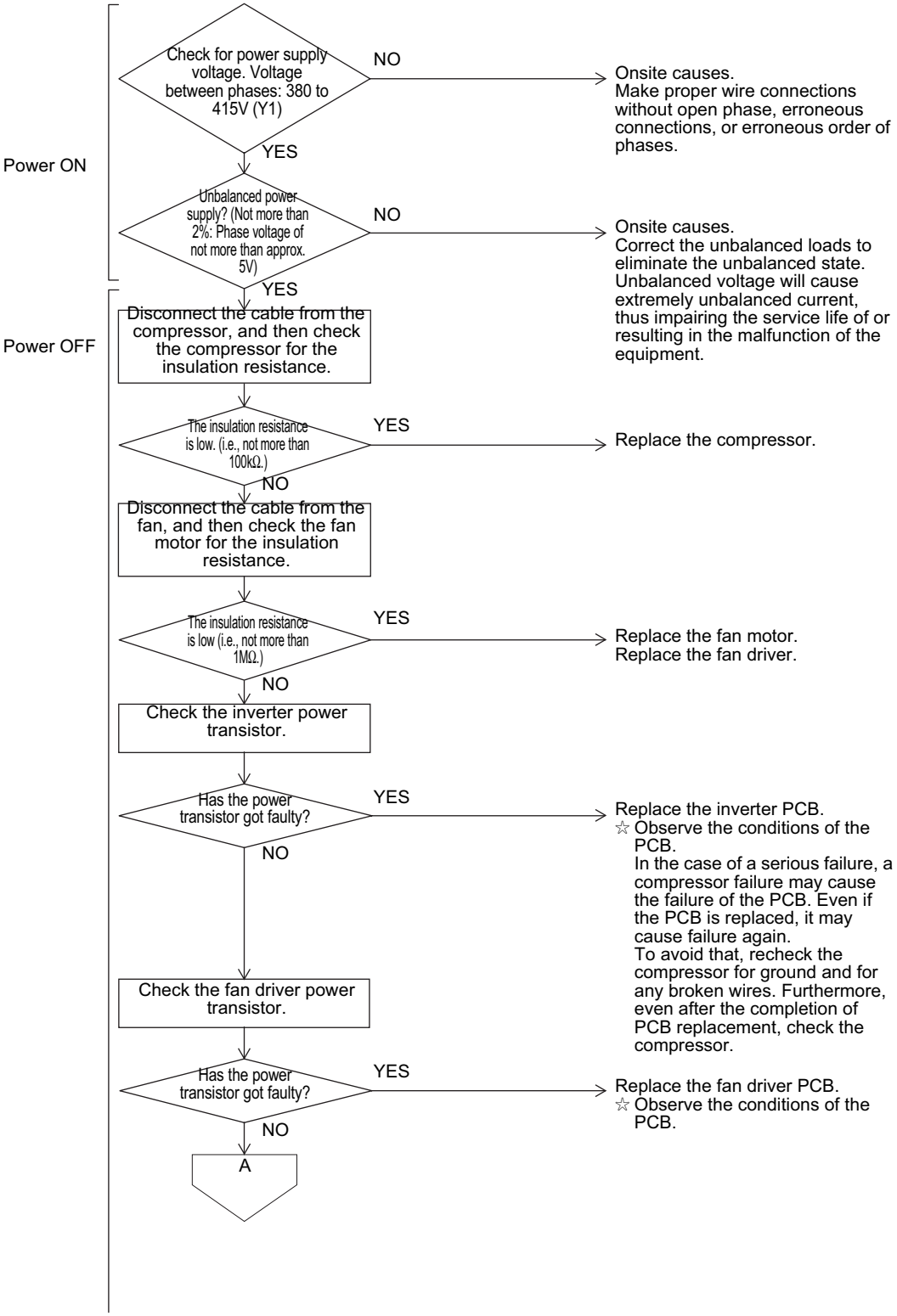


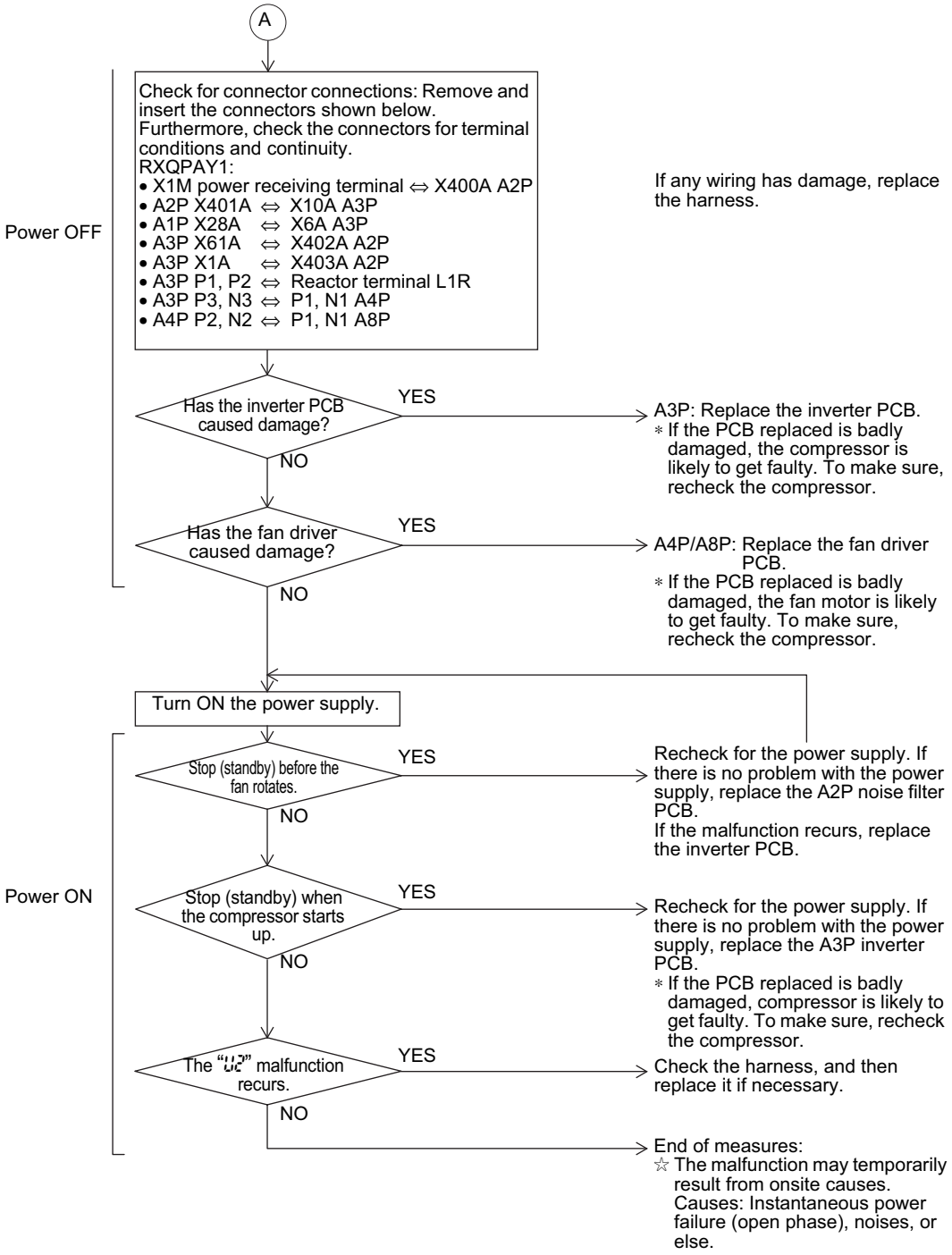
6.6.26 "U2" Abnormal Power Supply Voltage

Remote Controller Display	U2
Applicable Models	LRMEQ5~20PY1 LRLEQ5~20PY1
Method of Malfunction Detection	Malfunction is detected from the voltage of the main circuit capacitor in the inverter.
Malfunction Decision Conditions	When the voltage aforementioned is not less than 780V or not more than 320V, or when the current-limiting voltage does not reach 200V or more or exceeds 740V.
Supposed Causes	■ Power supply voltage drop ■ Instantaneous power failure ■ Open phase ■ Faulty inverter PCB ■ Faulty control box PCB ■ Faulty compressor ■ Faulty wiring in the main circuit ■ Faulty fan motor ■ Faulty connection of signal cable

Troubleshooting

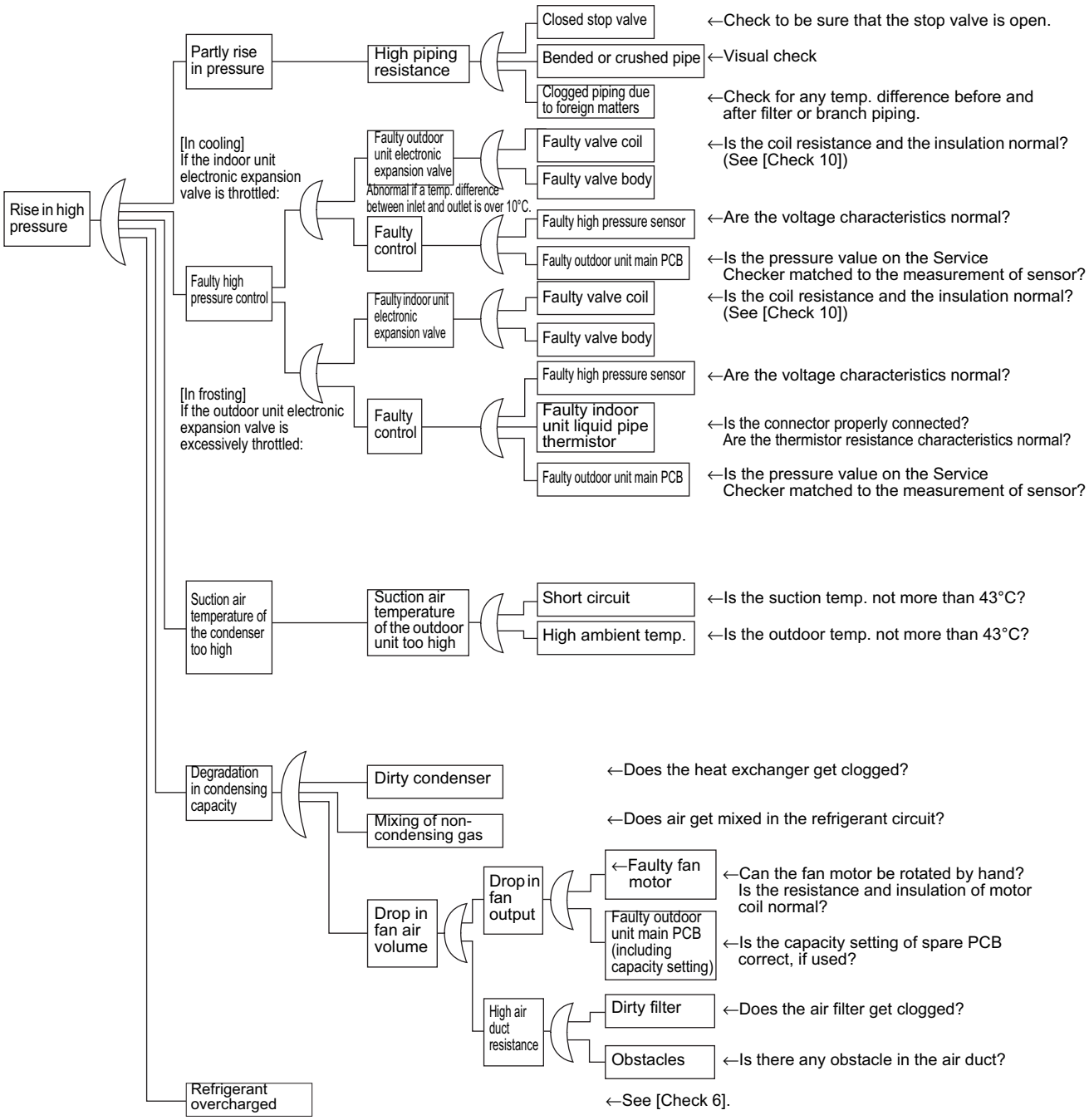
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.




A
Power OFF
Check for connector connections: Remove and insert the connectors shown below.
Furthermore, check the connectors for terminal conditions and continuity.
RXQPAY1:
• X1M power receiving terminal ⇔ X400A A2P
• A2P X401A ⇔ X10A A3P
• A1P X28A ⇔ X6A A3P
• A3P X61A ⇔ X402A A2P
• A3P X1A ⇔ X403A A2P
• A3P P1, P2 ⇔ Reactor terminal L1R
• A3P P3, N3 ⇔ P1, N1 A4P
• A4P P2, N2 ⇔ P1, N1 A8P
If any wiring has damage, replace the harness.
Has the inverter PCB caused damage?
YES
A3P: Replace the inverter PCB.
∗ If the PCB replaced is badly damaged, the compressor is likely to get faulty. To make sure, recheck the compressor.
NO
Has the fan driver caused damage?
YES
A4P/A8P: Replace the fan driver PCB.
∗ If the PCB replaced is badly damaged, the fan motor is likely to get faulty. To make sure, recheck the compressor.
NO
Turn ON the power supply.
Power ON
Stop (standby) before the fan rotates.
YES
Recheck for the power supply. If there is no problem with the power supply, replace the A2P noise filter PCB.
If the malfunction recurs, replace the inverter PCB.
NO
Stop (standby) when the compressor starts up.
YES
Recheck for the power supply. If there is no problem with the power supply, replace the A3P inverter PCB.
∗ If the PCB replaced is badly damaged, compressor is likely to get faulty. To make sure, recheck the compressor.
NO
The "UZ" malfunction recurs.
YES
Check the harness, and then replace it if necessary.
NO
End of measures:
☆ The malfunction may temporarily result from onsite causes. Causes: Instantaneous power failure (open phase), noises, or else.

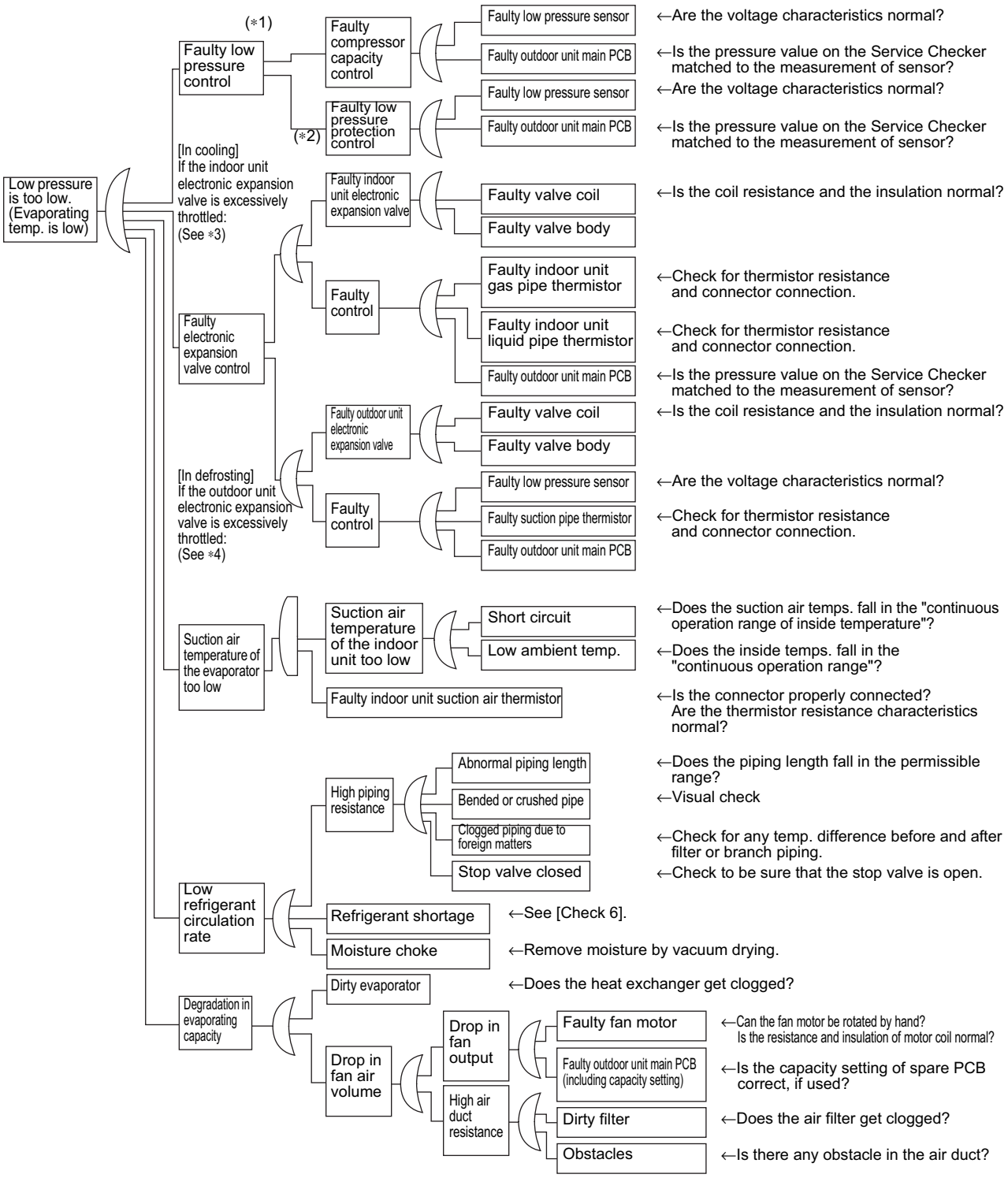
[Check 1] Check for Causes of Rise in High Pressure

Referring to the Fault Tree Analysis (FTA) shown below, identify faulty points.



[Check 2] Check for Causes of Drop in Low Pressure

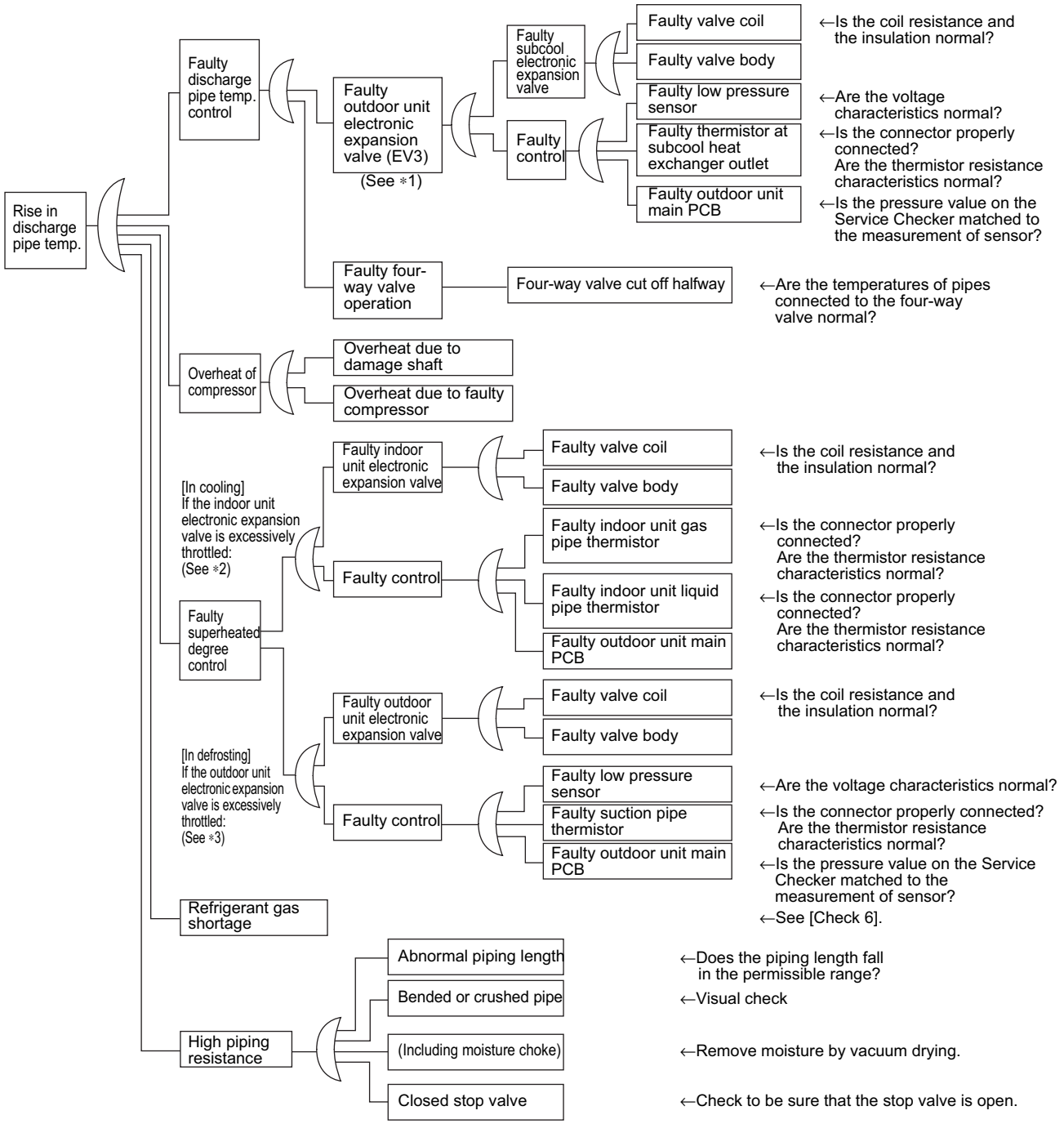
Referring to the Fault Tree Analysis (FTA) shown below, identify faulty points.



*1. For the compressor capacity control in cooling, refer to information in "Compressor Control".
*2. "Low pressure protection control" includes low pressure drooping control.
*3. The indoor unit electronic expansion valve exerts "superheated degree control" in cooling.
*4. The outdoor unit electronic expansion valve (EV1) exerts "superheated degree control of outdoor unit heat exchanger" in defrosting.

[Check 3] Check for Causes of Overheat Operation

Referring to the Fault Tree Analysis (FTA) shown below, identify faulty points.



∗1. For subcool electronic expansion valve control, refer to information in "Electronic expansion valve control".
∗2. The indoor unit electronic expansion valve exerts "superheated degree control" in cooling.
∗3. The outdoor unit electronic expansion valve (EV1) exerts "superheated degree control" in defrosting.
∗4. Guideline for superheated degree by which a malfunction is judged as overheat operation
(1) Suction gas superheated degree: Not less than 10°C / (2) Discharge gas superheated degree: Not less than 45°C; provided, however, that superheated degrees immediately after startup or for drooping control are excluded.
(The values aforementioned are just a guideline. Even if the values fall within the range shown above, these values may be normal depending on other conditions.)

[Check 4] Check for Power Transistor

<LRMEQ5~20AY1, LRLEQ5~20AY1>

Checking failures in power semiconductors mounted on inverter PCB

Check the power semiconductors mounted on the inverter PCB by the use of a multiple tester.

<Items to be prepared>

- Multiple tester : Prepare the analog type of multiple tester.
  For the digital type of multiple tester, those with diode check function are available for the checking.

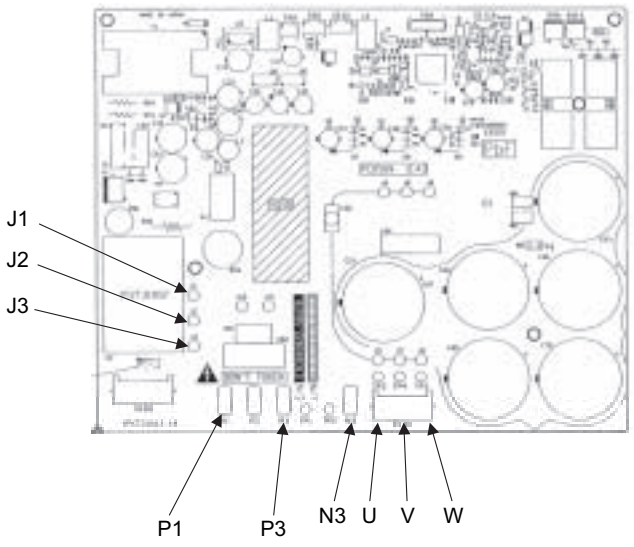
<Test points>

- Turn OFF the power supply. Then, after a lapse of 10 minutes or more, make measurement of resistance.

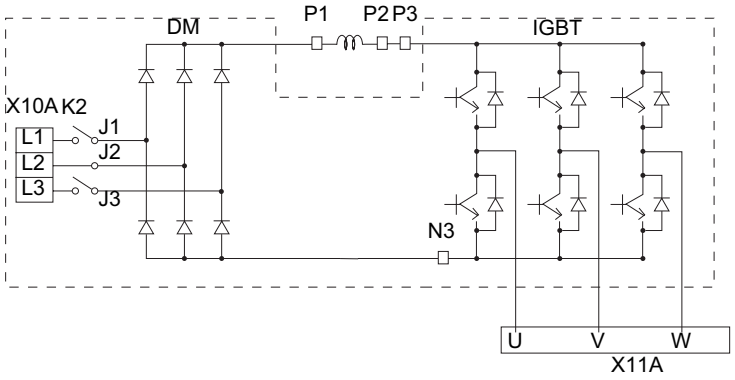
<Preparation>

- To make measurement, disconnect all connectors and terminals.

Inverter PCB



Electronic circuit

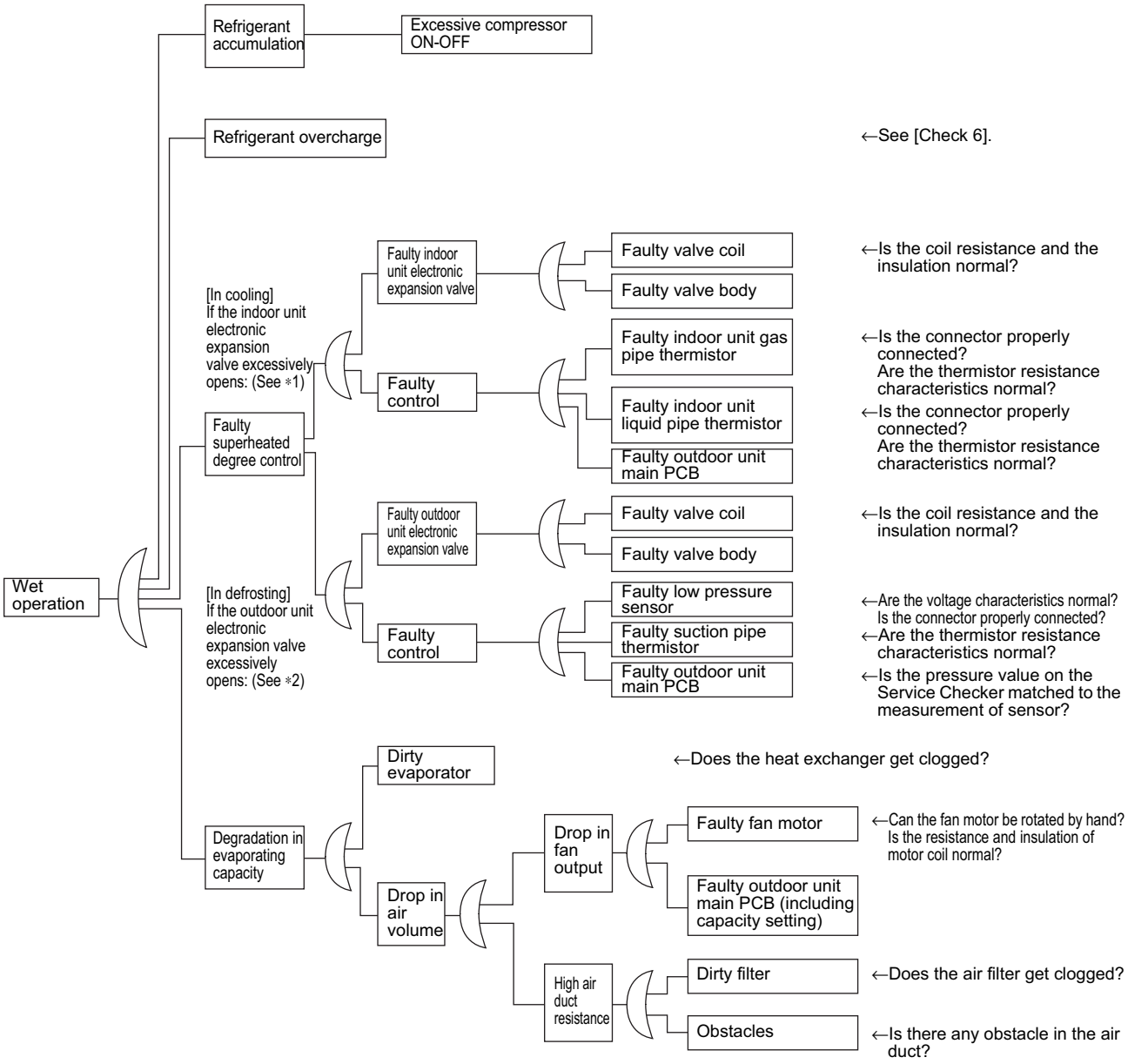


- According to the checking aforementioned, it is probed that the malfunction results from the faulty inverter. The following section describes supposed causes of the faulty inverter.
- Faulty compressor (ground leakage)
- Faulty fan motor (ground leakage)
- Entry of conductive foreign particles
- Abnormal voltage (e.g. overvoltage, surge (thunder), or unbalanced voltage)

In order to replace the faulty inverter, be sure to check for the points aforementioned.

[Check 5] Check for Causes of Wet Operation

Referring to the Fault Tree Analysis (FTA) shown below, identify faulty points.



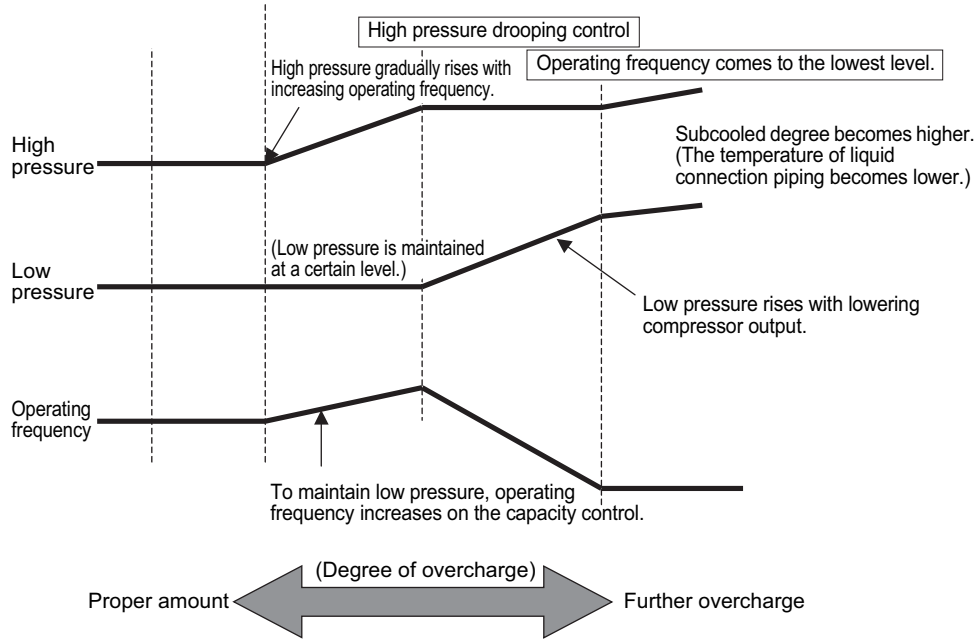
∗1. The indoor unit electronic expansion valve exerts "superheated degree control" in cooling.
∗2. The outdoor unit electronic expansion valve (EV1) exerts "superheated degree control" in defrosting.
∗3. Guideline for superheated degree by which a malfunction is judged as wet operation
(1) Suction gas superheated degree: Less than 3°C / (2) Discharge gas superheated degree: Less than 15°C; provided, however, that superheated degrees immediately after startup or for drooping control are excluded.
(The values aforementioned are just a guideline. Even if the values fall within the range shown above, these values may be normal depending on other conditions.)

[Check 6] Check for Refrigerant Amount

Due to relationship to pressure control and electronic expansion valve control, the refrigerant amount needs to be judged according to operating conditions.
Refer to information shown below for making judgements.

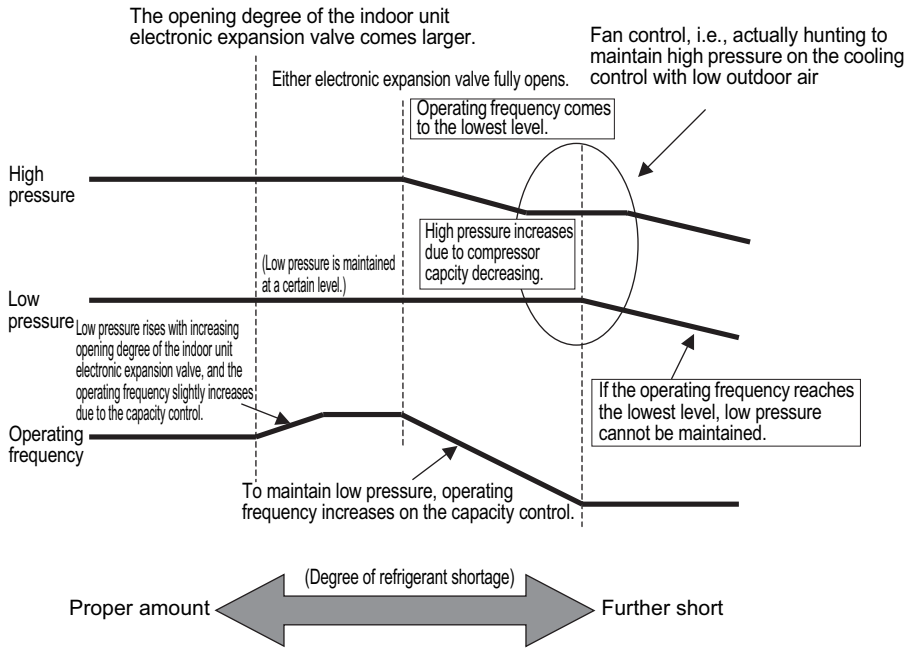
Diagnosis of Refrigerant Overcharge

1. High pressure becomes higher. Consequently, overload control is exerted to make the capacity slightly inadequate.
2. The superheated degree of suction gas becomes lower (or the system is put into wet operation). Consequently, the compressor discharge pipe temperature becomes lower for pressure loads.
3. The subcooled degree of condensate becomes higher.



Diagnosis of Refrigerant Shortage

1. The superheated degree of suction gas becomes higher, and the temperature of compressor discharge gas also becomes higher.
2. The superheated degree of suction gas becomes higher, and the electronic expansion valve shifts to slightly open.
3. Low pressure is too low to demonstrate cooling capacity (or heating capacity).
4. The liquid level gauge falls into the flash state.



[Check 7] Vacuum Drying Procedure

To conduct vacuum drying in the piping system, follow the procedure for <Normal vacuum drying> shown below.
Furthermore, if moisture can get mixed in the piping system, follow the procedure for <Special vacuum drying> shown below.

<Normal vacuum drying>

1. Vacuum drying
   - Use a vacuum pump that enables vacuuming to a vacuum level of -100.7kPa (5 torr, -755 mmHg).
   - Connect a manifold gauge to the service port of the liquid pipe and the gas pipe respectively, and then run the vacuum pump for a period of two or more hours to achieve vacuuming to a vacuum level below -100.7kPa.
   - If the vacuum level does not reach below -100.7kPa even after vacuuming for a period of two hours, moisture has got mixed in the system or the system has caused vacuum leakage. Consequently, conduct vacuuming for a period of another one hour.
   - If the vacuum level does not reach below -100.7kPa even after vacuuming for a period of three hours, conduct leak tests.
2. Leaving in vacuum state
   - Leave the piping system in a vacuum state at a level below -100.7kPa for a period of one or more hours, and then check to be sure that the vacuum gauge reading does not rise. (If the reading rises, moisture remains in the system or vacuum leaks from the piping.)
3. Additional refrigerant charge
   - Purge air from the hose connected to the manifold gauge, and then charge a necessary amount of refrigerant.

<Special vacuum drying> - In case moisture can get mixed in the piping*:

1. Vacuum drying
   - Follow the same procedure as that for normal vacuum drying 1 aforementioned.
2. Vacuum break
   - Pressurize to 0.05MPa using nitrogen gas.
3. Vacuum drying
   - Conduct vacuum drying for a period of one or more hours. If the vacuum level does not reach below -100.7kPa even after vacuuming for a period of two hours, repeat Steps 2 Vacuum break and Step 3 Vacuum drying.
4. Leaving in vacuum state
   - Leave the piping system in a vacuum state at a level below -100.7kPa for a period of one or more hours, and then check to be sure that the vacuum gauge reading does not rise.
5. Additional refrigerant charge
   - Purge air from the hose connected to the manifold gauge, and then charge a necessary amount of refrigerant.

   *Dew may condense in the piping due to construction during rainy season or a long construction period or rainwater may enter the piping during construction.

[Check 8] List of Malfunction Codes Related to Inverter

	Code	Name	Condition for determining malfunction	Major faulty point
Compressor current	L5	INV Compressor Instantaneous Overcurrent	■ Inverter output causes an overcurrent to flow even instantaneously.	■ Inverter getting caught in liquid ■ Faulty compressor ■ Faulty inverter PCB
	L8	Overcurrent of INV compressor (electronic thermal)	■ The compressor performs overload operation. ■ Loss of synchronization is detected.	■ Liquid back of compressor ■ Sharp change in load ■ Disconnection of compressor wiring ■ Faulty inverter PCB
Protection device, etc.	L1	Faulty Inverter PCB	■ No output is produced.	■ Faulty heavy current part of inverter
	L9	Faulty INV Compressor Startup	■ The compressor motor fails to start up.	■ Inverter getting caught in liquid or faulty compressor ■ Excessive oil or refrigerant ■ Faulty inverter PCB
	E5	Inverter Compressor Lock	■ The compressor is in locked state (does not rotate).	■ Faulty compressor
	L4	Rise in Radiation Fin Temperature	■ The radiation fin temperature exceeds the reference value (while in operation).	■ Malfunction of fan ■ Long-term overload operation ■ Faulty inverter PCB
	U2	Abnormal Power Supply Voltage	■ The inverter power supply voltage is high or low.	■ Abnormal power supply ■ Faulty inverter PCB
	P1	Power Supply Imbalance	■ The three-phase power supply has a significant voltage imbalance.	■ Abnormal power supply (Power supply imbalance of not less than 2%) ■ Faulty inverter PCB ■ End of PCB service life
	LC	Malfunction Related to Transmission (between Main PCB and Control PCB)	■ The outdoor unit PCB cannot make communications among the control PCB, inverter PCB, and fan PCB.	■ Broken wire in communication line ■ Faulty control PCB ■ Faulty inverter PCB ■ Faulty fan PCB
	P4	Faulty fin thermistor	■ The fin thermistor gets short-circuited or open.	■ Faulty fin thermistor

[Check 9] Temperature and Resistance Characteristics of Thermistor

■ Outdoor unit

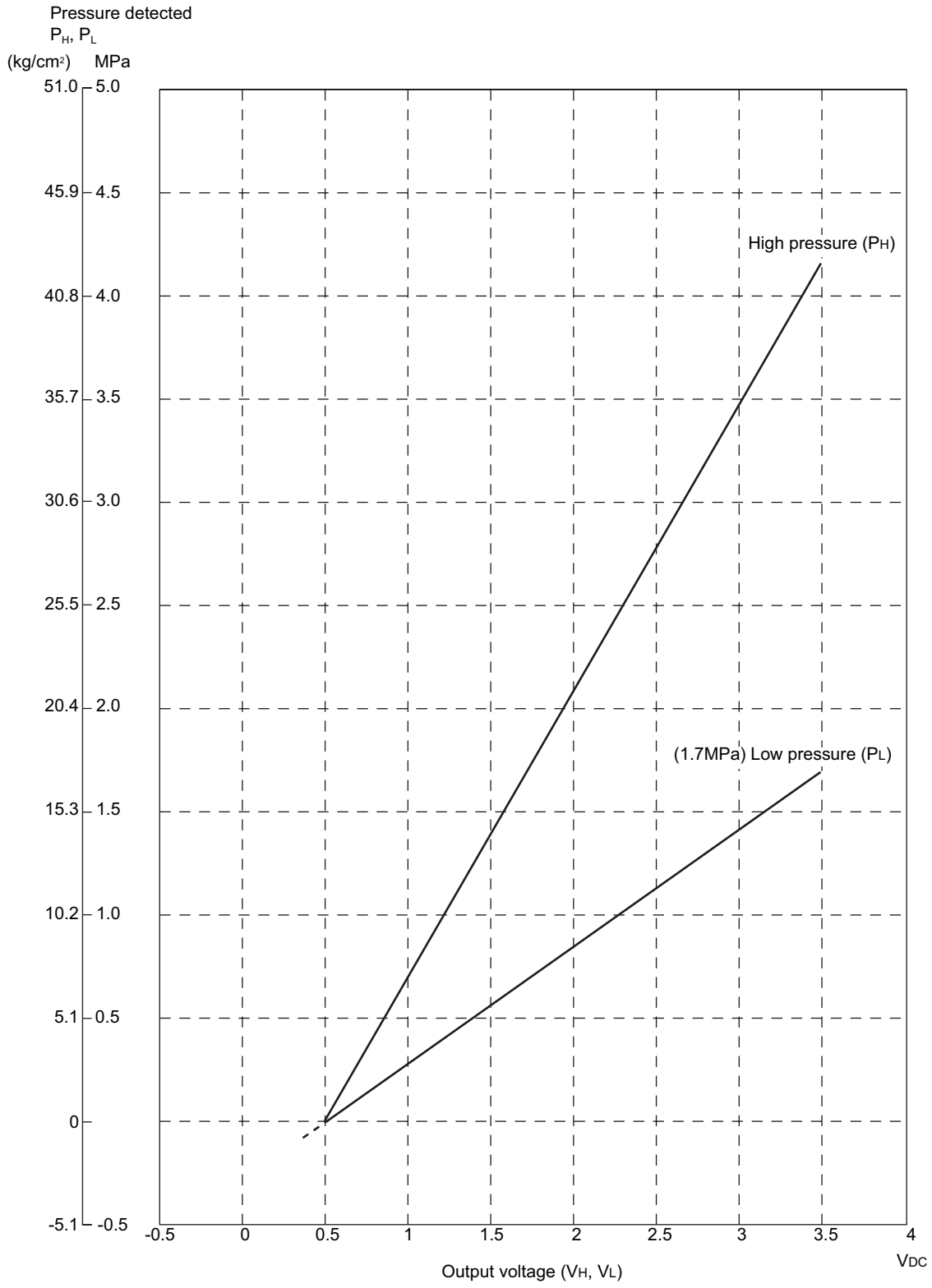
Applicable	Heat exchanger (Inlet and outlet)	Suction air	Discharge pipe	Radiation fin
Type	ST0601	ST0602	ST0901	PTP-46D-D1
Temperature(°C)	Resistance(kΩ)	Resistance(kΩ)	Resistance(kΩ)	Resistance(kΩ)
-10	112.0	10.9	1403.8	111.4
-5	85.5	8.6	1059.5	84.1
0	65.8	6.9	806.5	64.1
5	51.1	5.5	618.9	49.4
10	40.0	4.4	487.8	38.4
15	31.6	3.6	373.1	30.1
20	25.1	2.9	292.9	23.8
25	20.1	2.4	231.4	18.9
30	16.2	2.0	184.1	15.2
35	13.1	1.6	141.1	12.3
40	10.7	1.4	118.7	10.0
45	8.8	1.1	96.1	8.2
50	7.2	1.0	78.3	6.8
55	6.0	0.82	64.1	5.6
60	5.0	0.70	52.8	4.7
65	4.2	0.60	43.6	3.9
70	3.5	0.51	36.3	3.3
75	3.0	0.44	30.3	2.8
80	2.5	0.38	25.4	2.4
85	2.1	0.33	21.4	2.0
90	1.8	0.29	18.1	1.7
95	1.6	0.25	15.3	1.5
100	1.4	0.22	13.1	1.3
105	1.2	0.20	11.2	1.1
110	1.0	0.17	9.6	1.0
115	0.9	0.15	8.3	0.9
120	0.8	0.14	7.1	0.8

[Check 10] Voltage Characteristics of Pressure Sensor

$PH = 1.38V_H – 0.69$
$PL = 0.57V_L – 0.28$

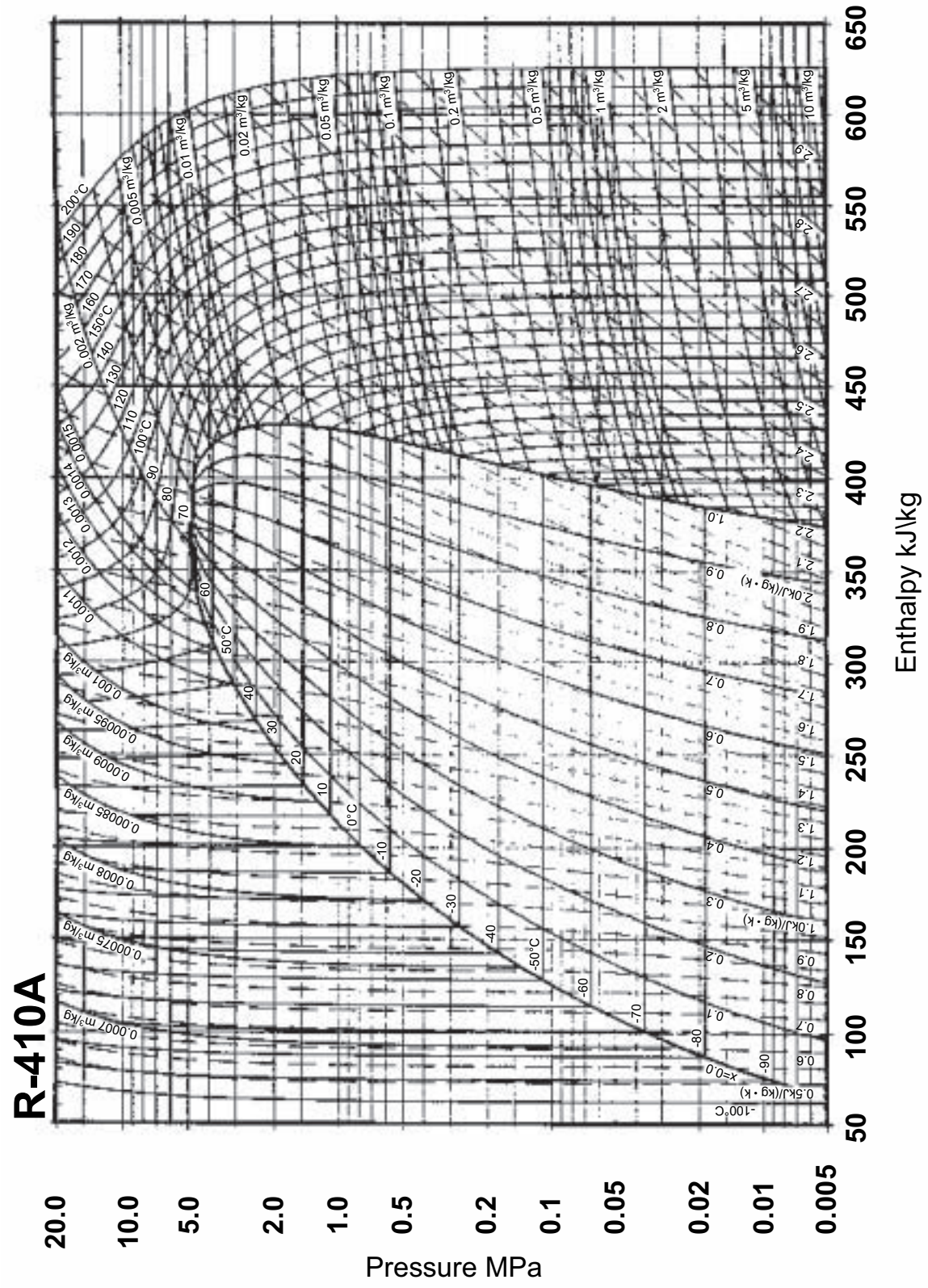
V_H : Output voltage [High pressure side] V_{DC}
V_L : Output voltage [Low pressure side] V_{DC}

PH : High pressure (MPa)
PL : Low pressure (MPa)



Characteristics of Refrigerant and Psychrometric Chart

Characteristics of Refrigerant R-410A



6.7 Maintenance

1. Procedure for Removal of Parts from Refrigerant System

As the results of checking a malfunction, if the malfunction results from part(s) used in the refrigerant system, remove the part(s) referring to the procedure for refrigerant recovery shown below.

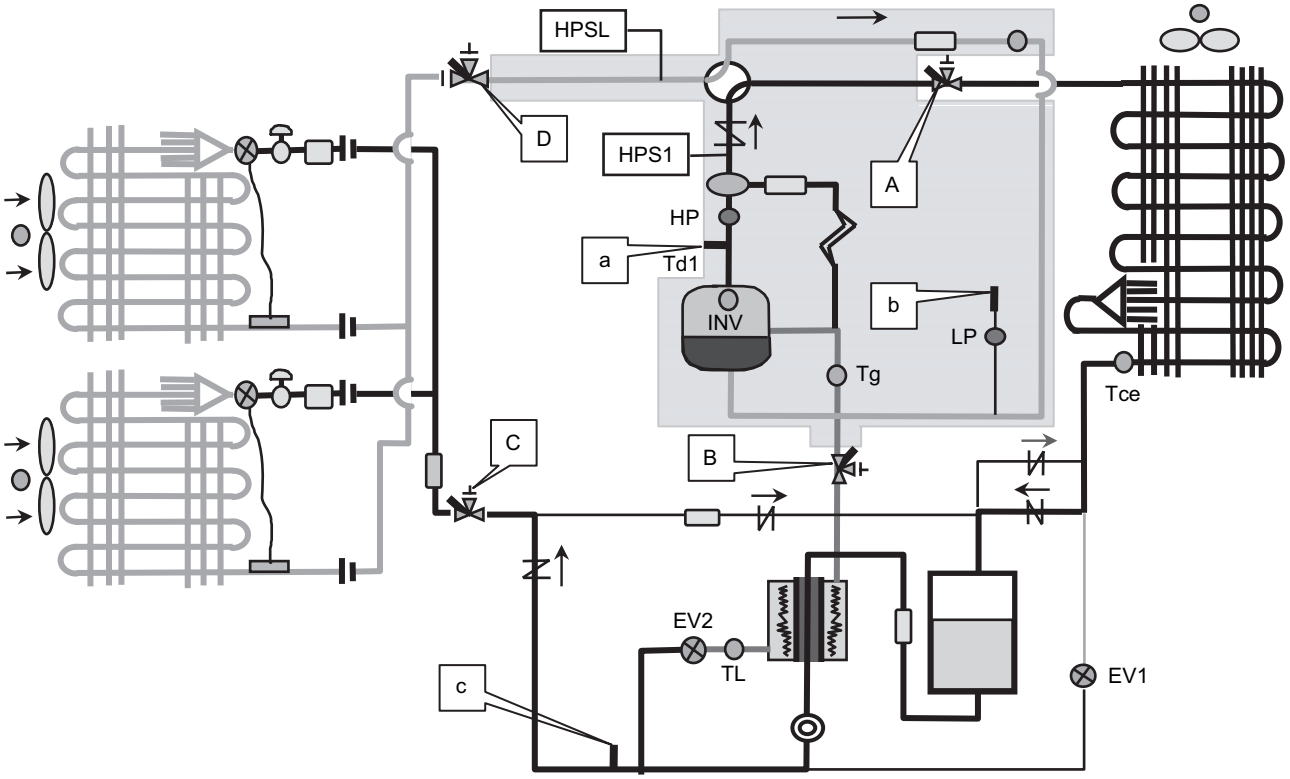
	Location of malfunction	Procedure for maintenance
1	■ Outdoor unit compressors (M1C, M2C and M3C) ■ Solenoid valves (for STD1 and STD2) ■ INV electronic expansion valve ■ Four way valve ■ High pressure switches	Refer to Maintenance 1.
2	■ Main electronic expansion valve ■ Injection electronic expansion valve	Refer to Maintenance 2.
3	■ Secondary equipment, such as a showcase ■ Dryer	Refer to Maintenance 3.
4	■ High pressure sensor ■ Low pressure sensor	A check valve allows it to be removed and replaced without any refrigerant recovery.

* If liquid refrigerant was recovered, add refrigeration oil according to the following criteria.
Refrigeration oil brand: Idemitsu DAPHNE FVC68D
Amount to be added: Volume of recovered refrigerant (kg) x 0.05 liter
(Example: If the volume of the refrigerant recovered is 24kg, 24 x 0.05 = 1.2 liter of oil that should be added.)
Fill port: Liquid stop valve service port
For details about adding oil, see the section that describes the refrigeration oil procedure.

1) Maintenance 1: Maintenance related to outdoor unit compressor

Applicable parts	• Compressors (M1C, M2C and M3C) • Solenoid valves (STD1 and STD2) • INV electronic expansion valve • Four way valve • High pressure switch
1 compressor	

No continuous operations allowed



A: Discharge line maintenance valve B: Injection line maintenance valve C: Liquid stop valve
D: Gas stop valve a, b, c: Service ports

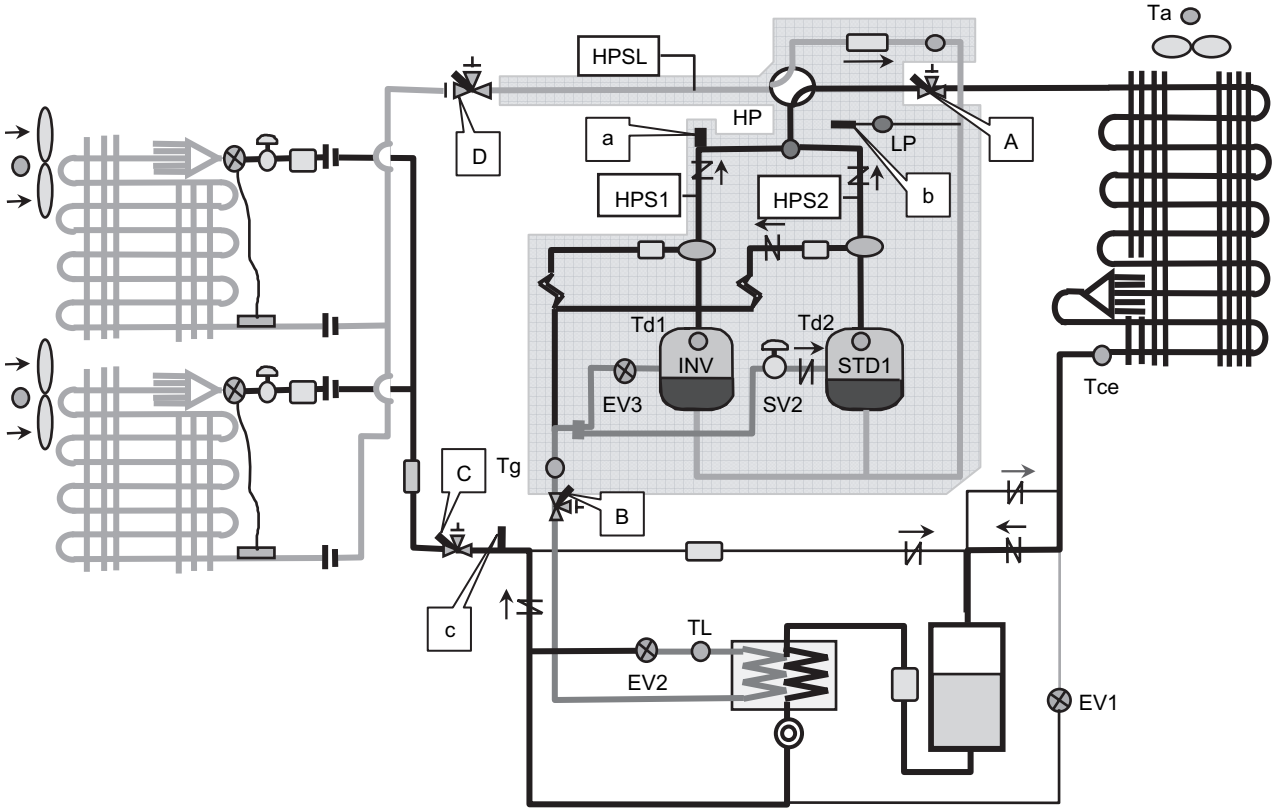
1. Turn off the operation switch for the outdoor unit. After the outdoor unit has stopped, turn off the power supply for the outdoor unit.
2. Remove the control box.
3. Close the stop valves in the order: A, D and then B.
4. Recover the refrigerant in the compressor through service ports a, b and maintenance valves A and B. (shaped region.)

   Repair or replace the applicable parts.

   ∗ After replacing the compressor, check whether the dryer is WET or DRY using the moisture indicator. If it is WET, replace the dryer.
5. Conduct air tight checks.
6. Conduct vacuuming through the service port b, and the maintenance valve A and B. (If the oil needs to be added, charge it through the service port a.)
7. Turn on the power supply for the outdoor unit. Then turn on the operation switch for the outdoor unit.
   (If a remote controller switch is used, enable the remote setting.)
8. Charge the refrigerant by the same quantity as that recovered.

Applicable parts	• Compressors (M1C, M2C and M3C) • Solenoid valves (STD1 and STD2) • INV electronic expansion valve • Four way valve • High pressure switch
2 compressors	

No continuous operations allowed



A: Discharge line maintenance valve B: Injection line maintenance valve C: Liquid stop valve
D: Gas stop valve a, b, c: Service ports

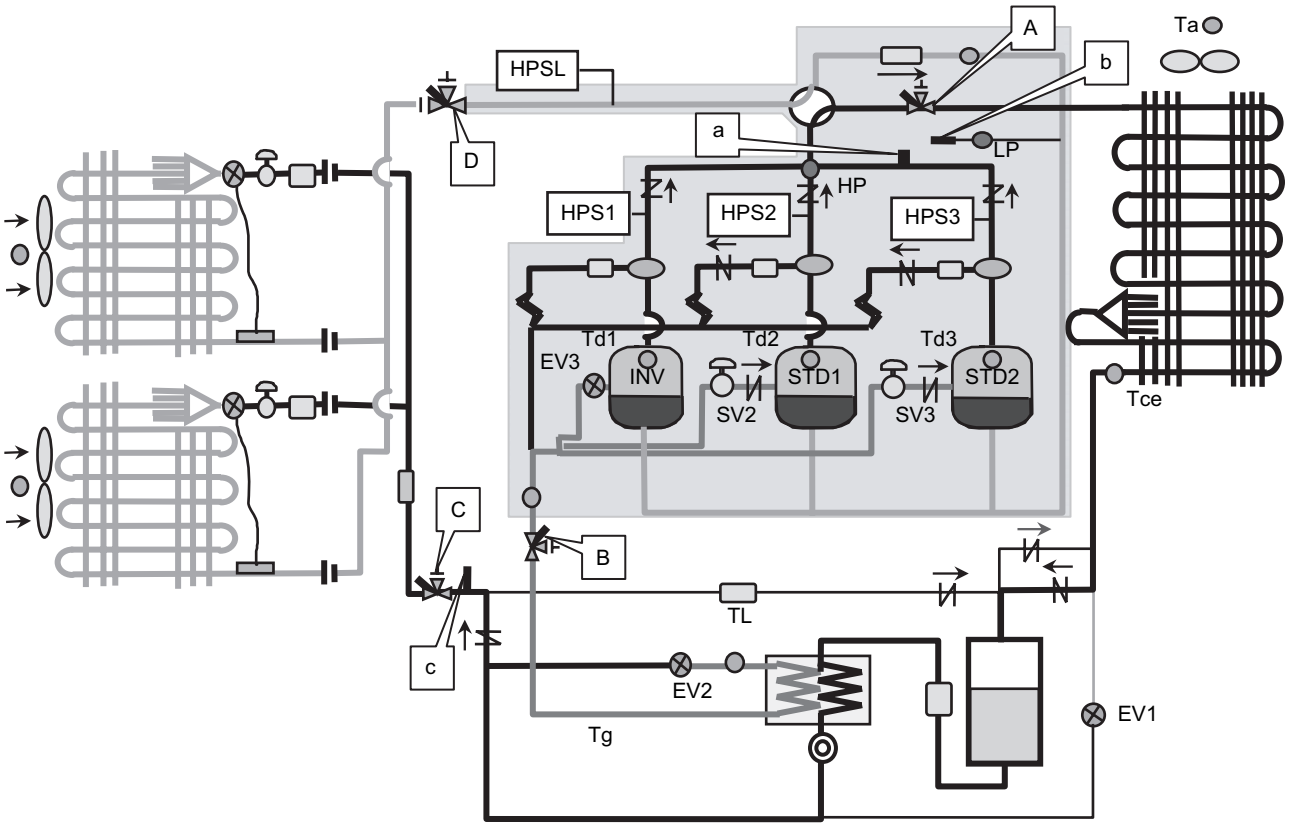
1. Turn off the operation switch for the outdoor unit. After the outdoor unit has stopped, turn off the power supply for the outdoor unit.
2. Remove the control box.
3. Close the stop valves in the order: A, D and then B.
4. Recover the refrigerant in the compressor through service ports a, b and maintenance valves A and B. (shaped region.)

   Repair or replace the applicable parts.

   * After replacing the compressor, check whether the dryer is WET or DRY using the moisture indicator. If it is WET, replace the dryer.
5. Conduct air tight checks.
6. Conduct vacuuming through the service port b, and the maintenance valve a and B. (If the oil needs to be added, charge it through the service port A.)
7. Turn on the power supply for the outdoor unit. Then turn on the operation switch for the outdoor unit.
   (If a remote controller switch is used, enable the remote setting.)
8. Charge the refrigerant by the same quantity as that recovered.

Applicable parts	• Compressors (M1C, M2C and M3C) • Solenoid valves (STD1 and STD2) • INV electronic expansion valve • Four way valve • High pressure switch
3 compressors	

No continuous operations allowed



A: Discharge line maintenance valve B: Injection line maintenance valve C: Liquid stop valve
D: Gas stop valve a, b, c: Service ports

1. Turn off the operation switch for the outdoor unit. After the outdoor unit has stopped, turn off the power supply for the outdoor unit.
2. Remove the control box.
3. Close the stop valves in the order: A, D and then B.
4. Recover the refrigerant in the compressor through service ports a, b and maintenance valves A and B. (shaped region.)

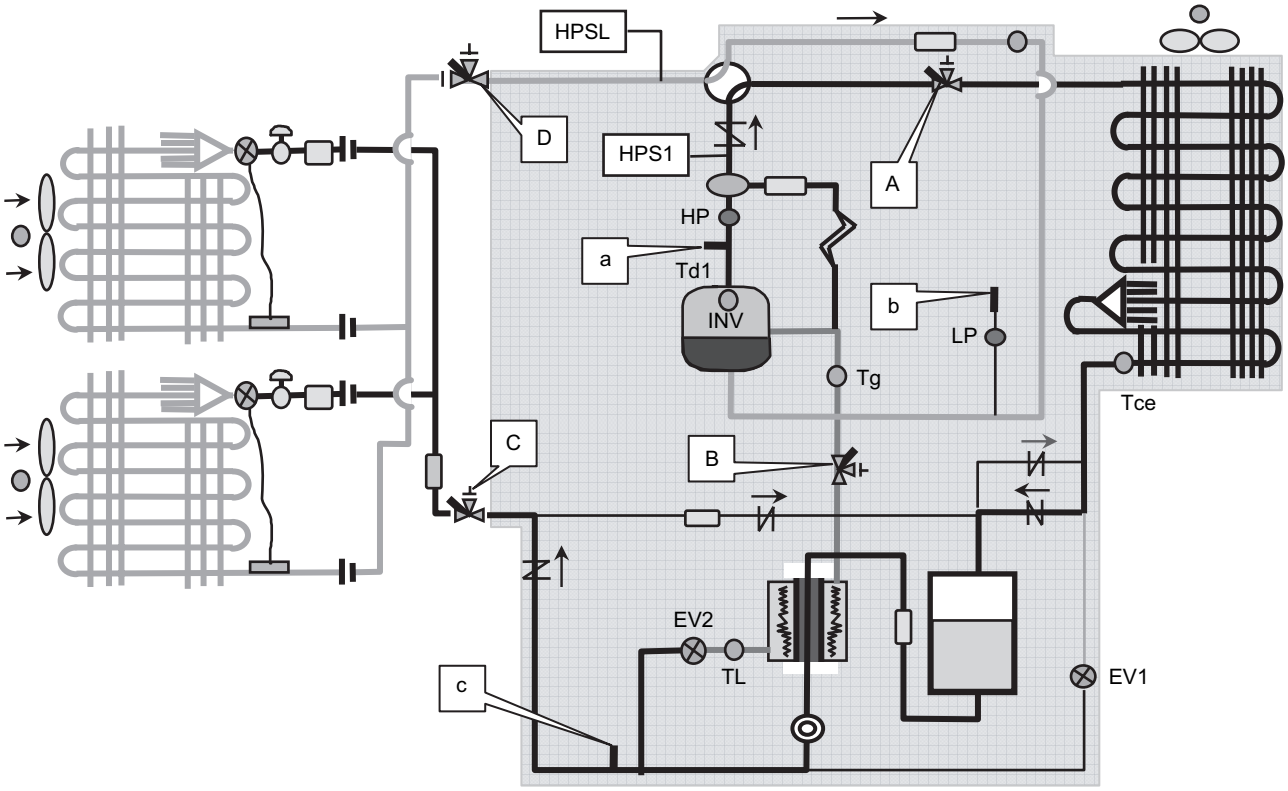
   Repair or replace the applicable parts.

   * After replacing the compressor, check whether the dryer is WET or DRY using the moisture indicator. If it is WET, replace the dryer.
5. Conduct air tight checks.
6. Conduct vacuuming through the service port b, and the maintenance valve a and B. (If the oil needs to be added, charge it through the service port A.)
7. Turn on the power supply for the outdoor unit. Then turn on the operation switch for the outdoor unit.
   (If a remote controller switch is used, enable the remote setting.)
8. Charge the refrigerant by the same quantity as that recovered.

2) Maintenance 2: Maintenance of EV1 and EV2

Applicable parts	• Main electronic expansion valve • Injection electronic expansion valve
1 compressor	

No continuous operations allowed



A: Discharge line maintenance valve B: Injection line maintenance valve C: Liquid stop valve
D: Gas stop valve a, b, c: Service ports

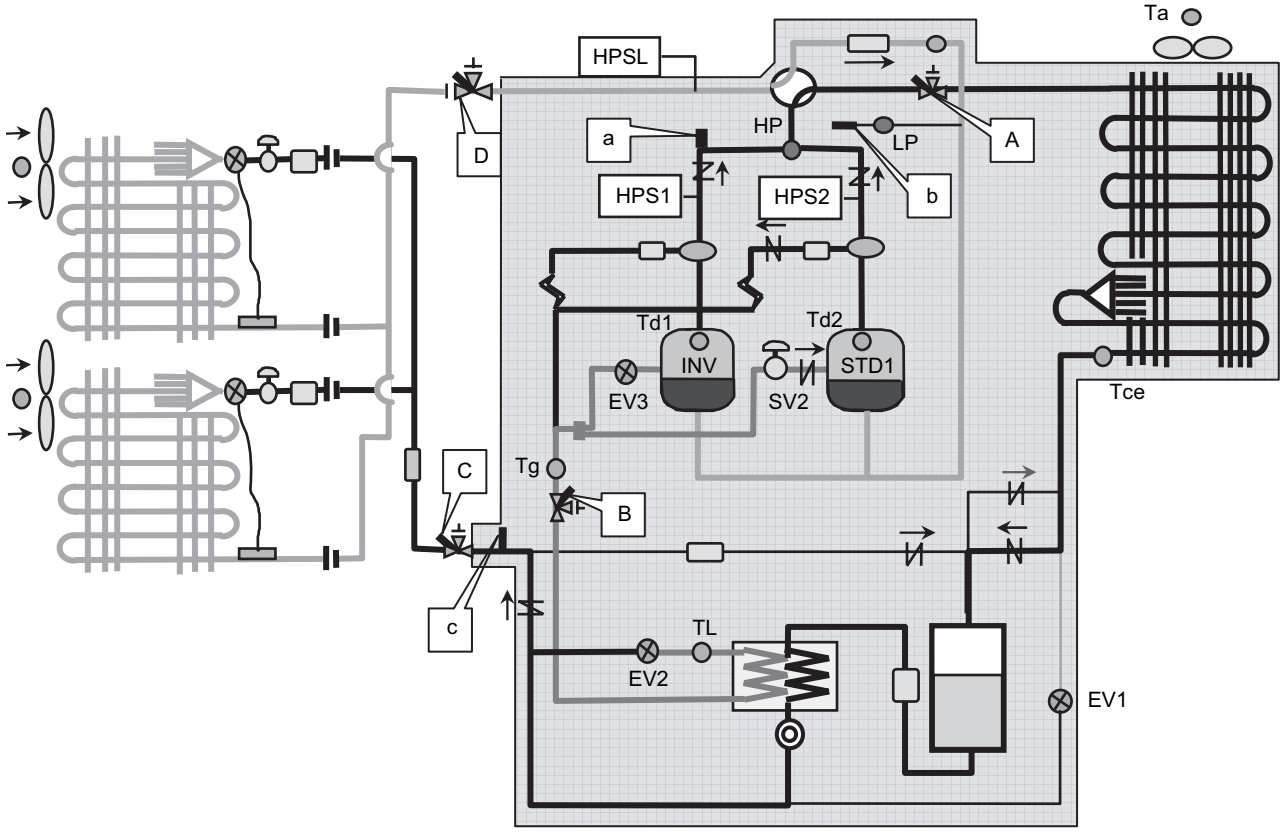
1. Turn off the operation switch for the outdoor unit. After the outdoor unit has stopped, turn off the power supply for the outdoor unit.
2. Remove the control box.
3. Close the stop valves in the order: C and D.
4. Recover the refrigerant in the compressor through service ports c, b. (shaped region.)

   Repair or replace the applicable parts.

   * After replacing parts, check whether the dryer is WET or DRY using the moisture indicator. If it is WET, replace the dryer.
5. Conduct air tight checks.
6. Conduct vacuuming through the service port c and b.
   (Then charge the refrigerant according to the quantity as that recovered. And then continue vacuuming.)
7. Turn on the power supply for the outdoor unit. Then turn on the operation switch for the outdoor unit.
   (If a remote controller switch is used, enable the remote setting.)
8. Charge the refrigerant by the same quantity as that recovered.

Applicable parts	• Main electronic expansion valve • Injection electronic expansion valve
2 compressors	

No continuous operations allowed



A: Discharge line maintenance valve B: Injection line maintenance valve C: Liquid stop valve
D: Gas stop valve a, b, c: Service ports

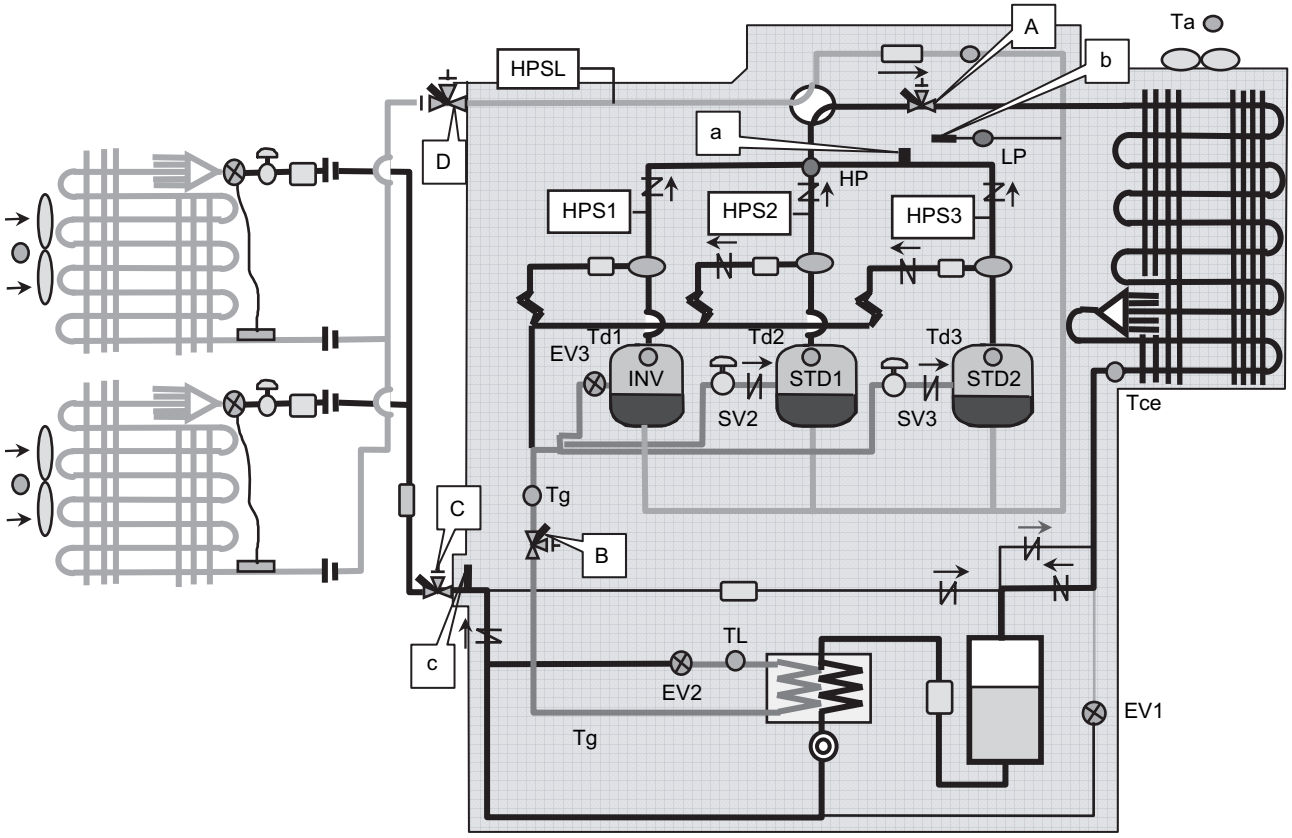
1. Turn off the operation switch for the outdoor unit. After the outdoor unit has stopped, turn off the power supply for the outdoor unit.
2. Remove the control box.
3. Close the stop valves in the order: C and D.
4. Recover the refrigerant in the compressor through service ports c, b. (shaped region.)

   Repair or replace the applicable parts.

   * After replacing parts, check whether the dryer is WET or DRY using the moisture indicator. If it is WET, replace the dryer.
5. Conduct air tight checks.
6. Conduct vacuuming through the service port c and b.
   (Then charge the refrigerant according to the quantity as that recovered. And then continue vacuuming.)
7. Turn on the power supply for the outdoor unit. Then turn on the operation switch for the outdoor unit.
   (If a remote controller switch is used, enable the remote setting.)
8. Charge the refrigerant by the same quantity as that recovered.

Applicable parts	• Main electronic expansion valve • Injection electronic expansion valve
3 compressors	

No continuous operations allowed



A: Discharge line maintenance valve B: Injection line maintenance valve C: Liquid stop valve
D: Gas stop valve a, b, c: Service ports

1. Turn off the operation switch for the outdoor unit. After the outdoor unit has stopped, turn off the power supply for the outdoor unit.
2. Remove the control box.
3. Close the stop valves in the order: C and D.
4. Recover the refrigerant in the compressor through service ports c, b. (shaped region.)

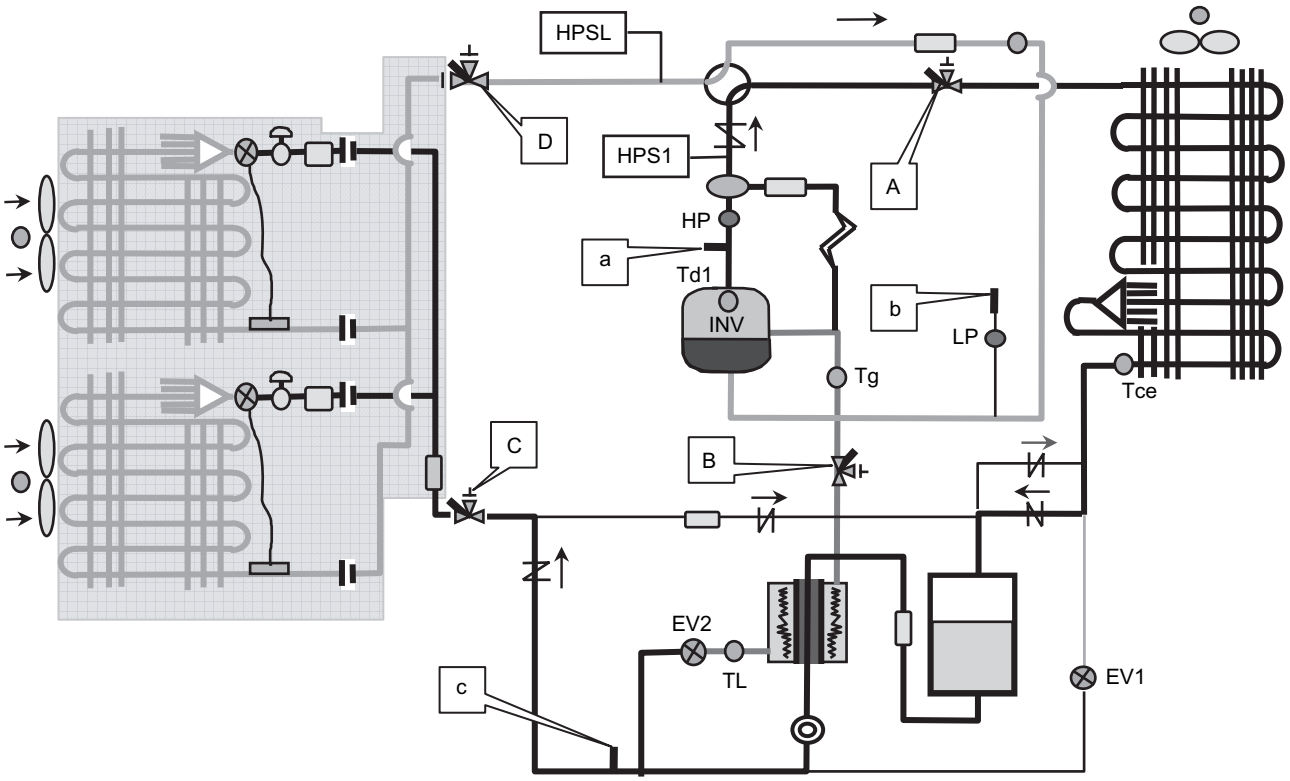
   Repair or replace the applicable parts.

   * After replacing parts, check whether the dryer is WET or DRY using the moisture indicator. If it is WET, replace the dryer.
5. Conduct air tight checks.
6. Conduct vacuuming through the service port c and b.
   (Then charge the refrigerant according to the quantity as that recovered. And then continue vacuuming.)
7. Turn on the power supply for the outdoor unit. Then turn on the operation switch for the outdoor unit.
   (If a remote controller switch is used, enable the remote setting.)
8. Charge the refrigerant by the same quantity as that recovered.

3) Maintenance 3: Maintenance of showcase and dryer

Applicable parts	• Main electronic expansion valve • Injection electronic expansion valve
1 compressor	

No continuous operations allowed



A: Discharge line maintenance valve B: Injection line maintenance valve C: Liquid stop valve
D: Gas stop valve a, b, c: Service ports

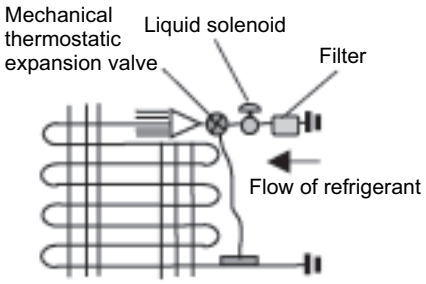
1. Close the stop valve C to conduct pump down operation.
   (The compressor will automatically stop or the pump down operation will be conducted for a period of 10 minutes.)
2. Turn off the operation switch for the outdoor unit. After the outdoor unit has stopped, turn off the power supply for the outdoor unit.
3. Remove the control box.
4. Close the stop valves in the order: C and D.
5. Recover the refrigerant in the compressor through the liquid stop valve C and gas stop valve D. (shaped region.)

   Repair or replace the applicable parts.
6. Conduct air tight checks.
7. Conduct vacuuming through the liquid stop valve C and gas stop valve D.
8. Turn on the power supply for the outdoor unit. Then turn on the operation switch for the outdoor unit.
   (If a remote controller switch is used, enable the remote setting.)
9. Charge the refrigerant by the same quantity as that recovered with a charging cylinder.

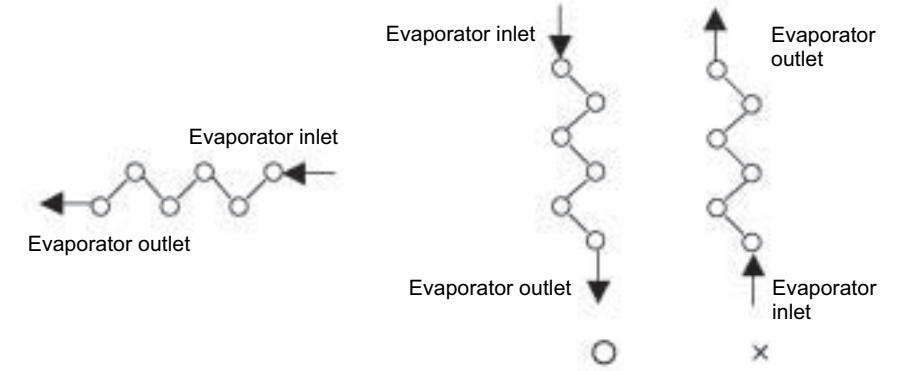
7. Appendix (Supplementary Information)

7.1 Restriction Matter of Showcase

- The design pressure of the indoor unit must be 2.5MPa.
- Install an R410A mechanical thermostatic expansion valve on eachlindoor unit.
- Install an R410A solenoid valve (Max. operating differential pressure of 3.5 MPa (35 bars) or over) on the primary side of the mechanical thermostatic expansion valve described above for each indoor unit.
- Install a filter on the primary side of the solenoid valve described above for each indoor unit. Determine the filter mesh count based on the size specified by the solenoid valve and mechanical thermostatic expansion valve being used.



- Route the path to the indoor unit heat exchanger so that the flow or refrigerant is from top to bottom.



- Wlhen installing a number of indoor units, be sure to install them at the same level. Difference in height between indoor units to be 5m or less.
- Use either off-cycle defrosting or electric heater defrosting as the defrostingltype. Hot-gas defrosting models cannot be used.

7.2 Selection of Expansion Valve

- The expansion valve must use made of the Danfoss.
- EEV (On/Off switching electric expansion valve) cannot be used.

7.3 Trouble Case with Present Machine (R-407C)

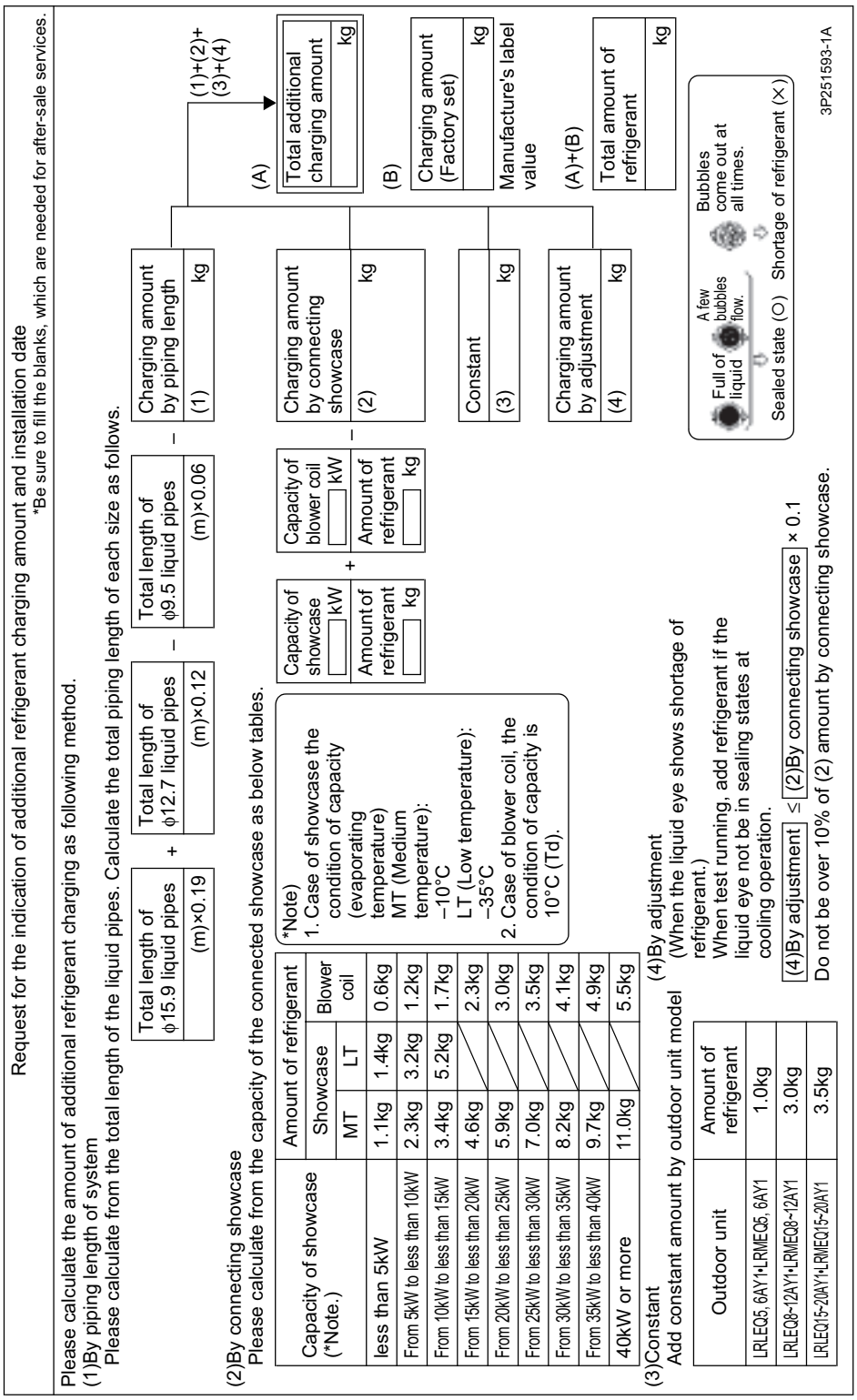
Compressor damage due to the overcharge of refrigerant in the field

■ **Cause**

By mistake, a local installer added 1.3 times of the total refrigerant, not 1.3 times of the additional charging refrigerant which is specified in the Installation Manual.
(It is already explained in the service news #MJ-08023. See the next page for more details.)

■ **Prevention of new models**

New models have improved compressor reliability by countermeasure control functions of current models. Also, the amount of the additional charging refrigerant at the field specified up to 0.1 times only.



Secret

DAIKIN SERVICE NEWS

MJ–08023

PR	<Convenience-pack> Re-precaution: Hard-and-fast additional refrigerant charge in commissioning
Model	LRLCP14D1, 2 and all other convenience-pack models

This is to inform you again of the precaution (MJ06053) "For additional charge in a commissioning of Conveni-pack, the upper limit shall be 1.3 times as much as that calculated." Because there was a compressor failure caused by over charge that is assumed to be due to a miscalculation.

[Case example]

At the time of calculation of the upper limit of additional charge, "Initial charge in outdoor unit" was added.

After the refrigerant was charged by the calculated upper limit above, the over charge "4.29kg (30% of 14.3kg of the initial charge in the outdoor unit)" caused the compressor failure.

[Upper limit of additional refrigerant charge in commissioning]

Correct [Additional charge in the field (Calculated value depending on piping length)] × 1.3

Wrong [Charge at factory + Additional charge in the field (Calculated value depending on piping length)] × 1.3

Example: Additional charge (Calculated value) :15kg ⇒The upper limit of additional charge : 19.5kg (15 × 1.3=19.5)

[Precaution for charging refrigerant]

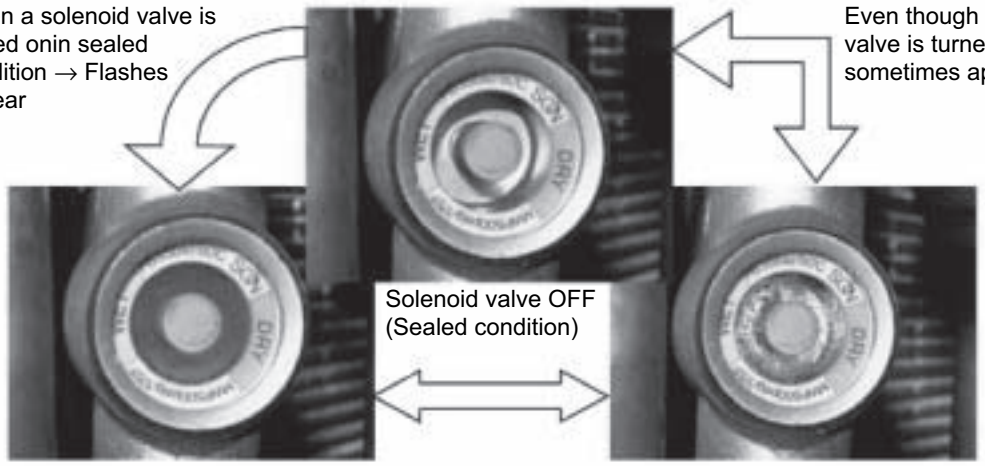
For additional charge, please do not charge the upper limit of refrigerant at a time.

When charging refrigerant more than additional charge in the field (calculated value), please charge refrigerant while observing through a sight glass.

A few bubbles are not problem. So please keep strictly the upper limit of additional refrigerant charge (This unit performs an oil return irregularly by on-off operation of a solenoid valve. Some transiently-generated flashes during the solenoid valve operation are not problem.)

When a solenoid valve is turned onin sealed condition → Flashes appear

Even though a solenoid valve is turned off, flashes sometimes appear.

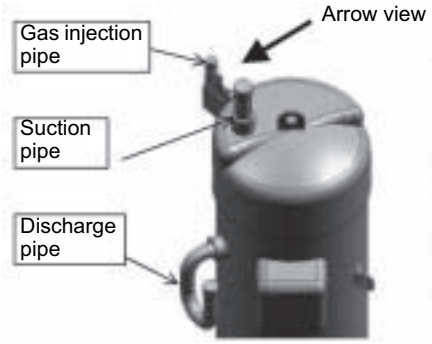


Solenoid ON (Flashes appear)

Solenoid valve After OFF (Just before sealed condition)

Method of removed and replaced compressor in field

This system's compressor has gas injection pipe. When you replace the compressor, you must remove the piping fixture with gas injection pipe.
Please follow the procedure, replace the compressor.

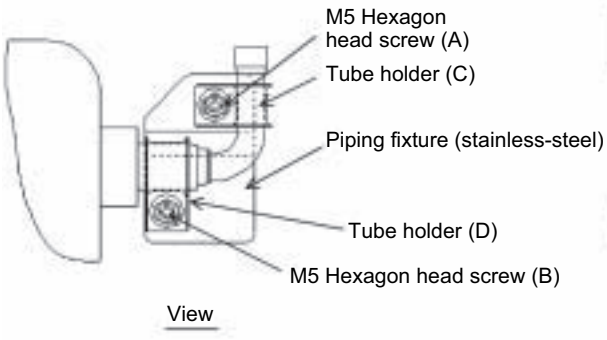


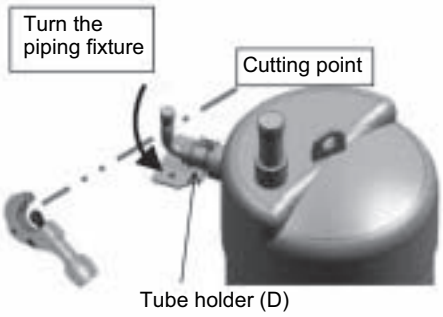
Method removed piping fixture for gas injection pipe

(1) Insert the tool from behind the compressor, remove the hexagon head screw (A) and tube fixture (C).On the other screw (B), slacken it.

(2) Turn the piping fixture on a point of tube holder (D), fold it toward.

(3) Cut the pipe for compressor with pipe-cutter.





Recommended tool for removed the screw

	Ratchet socket wrench	Spanner	Driver(+)
Tool			
	Expect the flat type	Only small size type	Only short-shank type

Installation of alarm

(Case example)

Because the unit stopped abnormally, and the temperature in the storage had risen, goods preserved on the inside were deteriorated.

(Cause)

The abnormal stop occurred because of the problem of the unit, and they display the abnormal signal. However the distant location of the unit and lacking of the alarming system allow the damage spreads.

Solution:
The following matters must be accepted by the customer at installation.

- Any secondary damage (such as deterioration and corrosion of the goods in the unit) is not covered by the manufacturer's warranty.
- Temperature control is the responsibility of the customer.

Please consider installing the alarming systems and spare units to minimize the damage. According to the circumstances, we recommend to arrange the damage insurance or after the sales service.

The unit is provided with a terminal to output an alarm signal.
If the system should malfunction and there is no alarm,the operation of the unit will be interrupted for a long time and damage to the commodities in storage may result.
The installation of an alarm is recommended in order to take appropriate measures promptly in such cases.
For details,consult your dealer.

7.4 Option List

Series	CONDENSING UNIT FOR REFRIGERATION SYSTEM					
Model / Option name	LRLEQ5AY1 LRLEQ6AY1 LRMEQ5AY1 LRMEQ6AY1	LRLEQ5AY1E LRLEQ6AY1E LRMEQ5AY1E LRMEQ6AY1E	LRLEQ8AY1 LRLEQ10AY1 LRLEQ12AY1 LRMEQ8AY1 LRMEQ10AY1 LRMEQ12AY1	LRLEQ8AY1E LRLEQ10AY1E LRLEQ12AY1E LRMEQ8AY1E LRMEQ10AY1E LRMEQ12AY1E	LRLEQ15AY1 LRLEQ20AY1 LRMEQ15AY1 LRMEQ20AY1	LRLEQ15AY1E LRLEQ20AY1E LRMEQ15AY1E LRMEQ20AY1E
Central drain pan kit	KWC26C160	★KWC26C160E	KWC26C280	★KWC26C280E	KWC26C450	★KWC26C450E

Note) ★: Order products

In all of us,
a green heart

Daikin's unique position as a manufacturer of air conditioning equipment, compressors and refrigerants has led to its close involvement in environmental issues. For several years Daikin has had the intension to become a leader in the provision of products that have limited impact on the environment. This challenge demands the eco design and development of a wide range of products and an energy management system, resulting in energy conservation and a reduction of waste.

Daikin Europe N.V. is approved by LRQA for its Quality Management System in accordance with the ISO9001 standard. ISO9001 pertains to quality assurance regarding design, development, manufacturing as well as to services related to the product.

ISO14001 assures an effective environmental management system in order to help protect human health and the environment from the potential impact of our activities, products and services and to assist in maintaining and improving the quality of the environment.

Daikin units comply with the European regulations that guarantee the safety of the product.

VRV products are not within the scope of the Eurovent certification programme.

DAIKIN EUROPE N.V.
Naamloze Vennootschap
Zandvoordestraat 300
B-8400 Oostende - Belgium
www.daikin.eu
BE 0412 120 336
RPR Oostende

SiENBE28-901 • 09/2009 • Copyright Daikin
Prepared in Belgium by Lannoo (www.lannooprint.be), a company whose concern for the environment is set in the EMAS and ISO 14001 systems.
Responsible Editor: Daikin Europe N.V., Zandvoordestraat 300, B- 8400 Oostende

SiENBE28-901